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ROCK PRODUCTS

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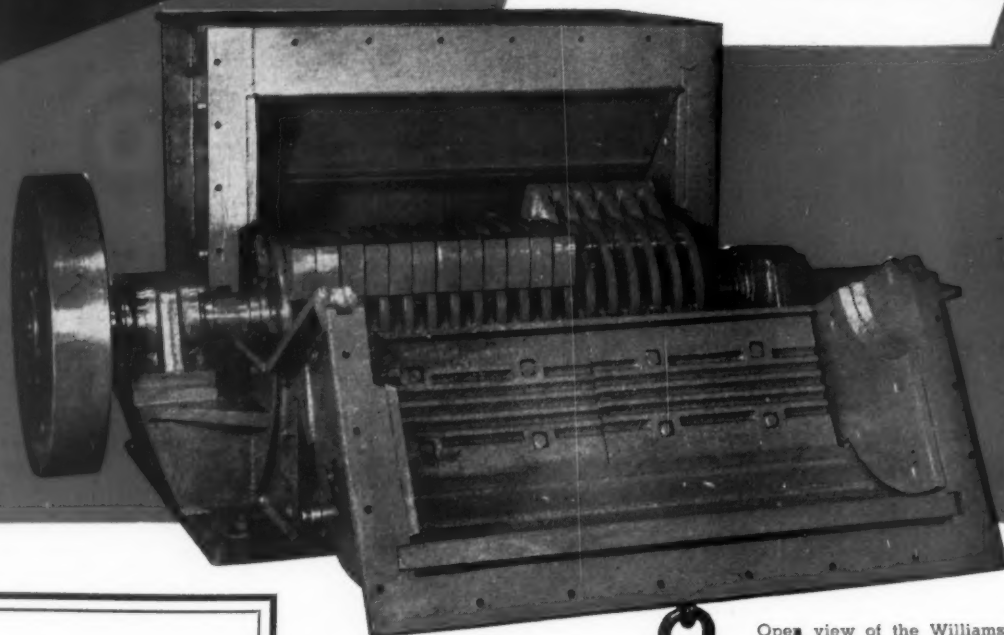


● World's deepest limestone mine operated by Pittsburgh Plate Glass Co.

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

**DESIGNED
ESPECIALLY FOR
AGSTONE**

**WILLIAMS
"NF" HAMMER
CRUSHER**



Open view of the Williams "NF" Mill showing heavy duty hammers, grinding plates, side liners and cover liners. Also shows easy accessibility to mill for repairs, etc.

FEATURES OF THE "NF"

- Adjustable grinding plate.
- Hammers adjustable to overcome wear.
- Larger capacities.
- Lifetime construction.
- 2" top liners, 1" side liners.
- Easy to work on—hinged cover.

The Williams "NF" Hammer Crusher was designed especially for reducing 4" or smaller stone to $\frac{3}{4}$ ", $\frac{1}{2}$ " or agricultural limestone. Embodies all the outstanding features Williams has developed in hammer mill design and construction and has proved itself an outstanding performer in the field.

The "NF" is built in a large range of sizes with capacities from 9 to 35 tons per hour when making agricultural limestone, affording a size mill for any job. Its principles of operation—a combination of crushing and grinding—enables it to make agstone that meets rigid size specifications at a good margin of profit to producers.

"We appreciate your inquiries—write today for additional information—no obligation on your part."

**WILLIAMS PATENT CRUSHER
& PULVERIZER COMPANY**

800 ST. LOUIS AVENUE
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WILLIAMS
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
WILLIAMS
PATENT CRUSHERS GRINDERS SHREDDERS

"WE HEAR..."

November, 1947

Cost of building factories, commercial structures and highways is continuing a slightly upward climb, attributable to higher materials prices, wage increases and persistent low labor productivity. To complicate the picture further, there continues to be shortages of materials, bricklayers, carpenters and heavy construction craftsmen.

Employment in the construction industry reached 1,948,000 workers in August, 1947, an increase of 14 per cent over August a year ago, reflecting a post-war high in construction 15 per cent over a year ago. The construction figure for the month was \$1.4 billion of which \$1.2 billion was new construction. A trend has been noted toward more private residential building and less commercial building.

Department of Commerce has just issued a manual to aid small businessmen in securing information about securing government contracts. The manual, giving information about federal procurement agencies and their technical requirements on contracts, is available from the field offices of the Commerce Department.

An employer is considered in violation of the law if he threatens to sell a business in order to coerce workers in their decisions on union organization, according to a ruling of the National Labor Relations Board. Thus, an employer had better think twice before advising employees of a possible sale. Such a statement might be construed as pressure brought to discourage joining a union.

The fact that an employee is an executive or administrative employee is not cause for exemption from overtime requirements of the Fair Labor Standards Act, if he devotes most of his time to clerical work, according to a federal district court ruling upholding the Wage-Hour Administrator. Whether or not an employee must use independent judgement in his work is the criterion.

More than ten per cent of the skilled workers employed in building and construction jobs are apprentices according to Secretary of Labor Schwollenbach. Progress has been substantial from recruiting practices. Over the past two years, the number of local joint apprenticeship committees or programs has multiplied over two and one half times.

Bureau of Reclamation regional offices have been told to proceed all-out on the \$195,000,000 in construction work set as the goal for the 1948 fiscal year. Operations are aimed at achieving the long-range goal for 1954--full and supplemental irrigation water supplies for 3,875,000 acres of land, installation of 2,250,000 kw. of hydroelectric power capacity and other stream benefits.

WE HEAR

Residential starts rose to 83,000 units in August, which is a postwar record. Work was started on 25,166 new housing units financed by FHA which is another post-war record. Builders are said to be completing new houses at the rate of 330 an hour for each eight-hour day.

U. S. Treasury Department has suggested that the federal government withdraw from motor fuel taxation and likewise that the States quit taxing tobacco products to eliminate duplication by federal and State governments. Of 43.9 billion dollars collected in taxes by State and federal governments in 1946, more than 90 per cent came from duplicate excises.

There is small wonder that industry is feeling the car shortage. A new high in carloading, of 937,954 cars, the week ended September 27 exceeded the wartime record for a week by 2.3 per cent. And, the present volume of freight is being handled with 500,000 less freight cars than in 1930.

New capital available for construction in the first 32 weeks of 1947 totalled \$2,301,000,000, a decline of 17 per cent from funds available a year ago, for the same period, according to Engineering News-Record. The drop was due to a decline in new federal money appropriated. However, private capital investments in 1947 rose 47 per cent.

Sacked concrete was used for bank protection on a project in Niles Canyon, near Sunol, Calif., where a highway was being built with the center of an old creek channel near the top edge of the highway. Cement and aggregates were placed dry in sacks and later were wet to form concrete.

According to latest information, 50,000 prefabricated houses will be shipped for all of 1947, comparing with 37,000 units in 1946. The estimate is based on shipping 35,000 of the total in the last six months of the year, availability of plywood and other materials being the reason for optimism.

Employers can legally refuse to bargain collectively with foremen since passage of the Taft-Hartley Act which does not recognize the right of foremen to organize and to bargain collectively.

An employe of a sand and gravel producer lost his life recently when struck by a bolt of lightning which, according to newspaper reports, practically rivited him to the floor of a gondola car. The worker was patching up the car in preparation for loading it, at the time the storm broke.

In his September editorial, the editor of Coal Age discusses the merits of rock dusting to limit the spread of mine explosives. One suggestion he pointed to was that as soon as a crosscut is made, the crosscut and the working place behind should be thoroughly treated. With all crosscuts properly dusted a dust explosion can be confined to one place and cannot spread through the crosscuts to, possibly, an entire working area.

An employer with a policy of granting periodic wage increases based on length of service must credit a reinstated veteran with time spent in the armed services, when deciding when the veteran is entitled to a salary increase.

Changing a business from a partnership to a corporation does not necessarily make it unnecessary to deal with the established collective-bargaining representative in a plant involved. The decision rests on whether or not a new business actually was created.

THE EDITORS

Editor's Page

Proportioning of Federal Highway Funds

THE FEDERAL-AID HIGHWAY ACT of 1944, as its objectives materialize, will have profound influence on the nation's economy and, in the years immediately ahead, on the production requirements to be met by the rock products industries that supply materials for highway and street construction.

An integrated development of all major classes of highways and streets comprising the national network, as set forth in the 1944 Act, specifically recognizes urban traffic conditions—the real needs of users in proportion to the degree that they use roads and pay taxes for their maintenance and construction. A change in emphasis, from new rural highway construction to roads and highways in and around urban areas, has long been needed as all of us who are constantly being ensnared in city congestion are fully aware.

Program for Cities

Cities in their new relation to the Federal highway program, as set forth in the Act, will now have full recognition and gain a fair, proportionate share of appropriated funds to relieve conditions that have reached emergency status. This new relation has been clarified by Thomas H. MacDonald, Commissioner of the U. S. Public Roads Administration. Speaking before the Business Men's Conference on Urban Problems, U. S. Chamber of Commerce in Washington, September 11, on the subject, he said:

"The time when highway needs of the cities might be regarded as of lesser concern than rural needs, is past, and too long past. No finding of the State-wide highway planning surveys is more clearly established than the fact that the tides of rural highway movement have either their origins or their destinations predominantly in the urban areas. No longer tenable is the idea, once prevalent, that cities are places to be avoided or bypassed by through highways. With certainty, we know now that the traffic that moves on these primary rural highways in the vicinity of every city is, in its majority, a traffic destined to, originated in, the city; that this majority rises to 90 per cent or more in the vicinity of the largest cities, and remains substantial in the vicinity of cities much smaller, even down to the town of 5000 population. It is clear, therefore, that the rural highways must have adequate connection into, and through the cities, if their traffic is to be properly facilitated to its predominantly city destinations, and from its predominantly city origins."

Mr. MacDonald's facts at hand substantiate a complete reversal in administration of the pro-

gram as contrasted to policies set forth in the Federal Highway Act of 1921. Then, and for a period of years, rapid construction of a main rural highway system was the objective to keep pace with the growth of motor car transportation, and it was satisfactorily accomplished. Use of allocated funds for urban use in road development during the 1920's was not provided for and, in specific laws, was actually prohibited.

The many years of emphasis on rural highways and the disproportionate consideration given the cities is brought out by a breakdown of fund allocation. Using Mr. MacDonald's figures again, only 4.4 per cent of funds available for road and street purposes in 1946, was directly allocated for expenditure by municipalities.

To accomplish the objective of an integrated highway and street program, \$125 million annually has been ear-marked in the 1944 Act for exclusive expenditure in urban areas. To producers of highway construction materials, this means that cities will spend 50 per cent more, because of expenditures for principal thoroughfares in the federal-aid highway system, than they are at present spending for construction, maintenance, administration and interest payment on all roads under their jurisdiction.

Indirect Economic Benefits

Expenditures directly related to those outlays, for grade separations, parking terminals, etc., and stemming from the stimulus on the economic and social life of a community that a construction program for the very re-design of cities and communities envisages, has enormous potentialities.

Expressways through and circumventing cities are bound to hasten decentralization from civic centers, extending the residential areas outwardly from cities and affecting commerce and industry as well.

Furthermore, construction exerts an enormous influence on the nation's economic welfare and the timing of self-liquidating public construction such as streets and roads can, as it has in the past, level off the peaks and valleys of private construction. Public construction of this nature contributes immeasurably to the productive capacity of the nation—to its output of durable goods which directly determines prosperity as measured by degree of national employment.

Broer Nordberg



INTERNATIONAL POWER Pays Off At The Chute

International Diesel Crawlers are right at home in the sand pit. Their ability to push heaping loads to the chute pays off in profits. Their low fuel and maintenance requirements add to the "take." And their in-built, all-weather, instant starting system means many hours of time saved every month.

Put an International Diesel Crawler to work in your operations and see for yourself how International Power pays off at the chute. Ask your International Industrial Power Distributor to help you select the model that's best for your jobs.



An International TD-18 Diesel Crawler is shown here working sand up to the hopper of a dry screening plant. The pit, worked by the Chandler Palos Verde Sand & Gravel Company, is located in the southwest outskirts of Los Angeles. 2500 tons of sand are taken daily from this mammoth pit.

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Rocky's

NOTES

Nathan C. Rockwood

Reflections on "Social Security"

PERHAPS it is the environment because as this is written the editorial consultant of ROCK PRODUCTS is spending a brief vacation in his native New England, Cape Cod, to be exact. For the past few days, he has been associating with retired executives of big business organizations—men who have been retired on generous pensions, plus their social security government pensions. This last possibly keeps them in cigars and tobacco, and if modest, in liquor. Nevertheless, they do not refuse to accept it, probably because they have been good business men and never overlook any sources of income.

In most instances, these men have served their corporations thirty years or more; and the pension systems of many such corporations were established comparatively recently, so some are getting more than they would have been entitled to on any regular insurance annuity basis. Moreover, probably most of them, having been prosperous and having lived in a period when thrift was a virtue, have accumulated enough to end their days in plenty without a pension.

All this means, of course, that corporations are paying them pensions, at least in considerable part, out of current income and profits. With such men living longer lives than the previous generation, one can not help speculating on the soundness of the whole system, which is a vital question now because one of the most important objectives of union labor today is to make corporation pension systems of universal application. From a socialistic angle there is, of course, every argument in its favor; but some, at least, of the recipients of such pensions, doubt the economic soundness of the whole idea.

Producers Must Pay

When the time comes that some 33 1/2 per cent of the population is under age, another 33 1/2 per cent overage or retired, we shall have 33 1/2 per cent or less of the total population, including women who work for wages, producing wealth and services, and sharing it with 66% per cent of the population who make no personal contribution to production or services. Naturally, the third who work and

produce will demand high wages, but their high wages increase production costs to themselves as well as for every one else. Add these cost increases to the taxes, direct and indirect, which are required to support "social security" public and private pension systems, and you have a rather top heavy social structure.

The old timers say it takes two or more of the new junior executives to handle the jobs they used to do single-handed, and consequently, the salaries of the new executives are not on a par with what the old ones got, even in the days before the confiscatory income taxes. Since most large corporations want their executives to maintain a scale of living commensurate with the dignity of the organization, the new executives, from that angle, at least, are little better off than the "poor working man." They can no longer save money for their individual security, as their predecessors did.

Apparently, the pensioners are deservedly happy in their retirement, and some of them revert to nature and lead natural lives for the first time in many years. One would hardly recognize them on The Cape as former vice-presidents of banks and big industrial enterprises from their appearance, although apparently they do not want it forgotten that they were.

An Economic Loss

Presidents on the retired list are not so frequently met with, probably both because there are fewer of them and because ex-presidents are more apt to stick around as chairmen of the boards of directors, where their long experience in over-all direction makes their counsel desired. The ex-vice-presidents have usually been specialists, and times make many changes in their specialties, so that younger executives are often more desired. Hence, we have many corporations which insist on retirement at 65 or less, regardless of the man's physical or mental capabilities.

It seems to us that this is a serious economic loss to society, for many of these men could be very useful. As it is, they are by no means a drag on society, for they spend liberally on their summer or permanent homes

and on their hobbies. In localities like Cape Cod, which is practically barren of any source of wealth except a small fishing industry, the retired gentlemen support directly or indirectly the entire native population. Their taxes have largely paid for the paved highways and other public improvements, and the natives' cash incomes are derived largely from service establishments and casual work for the summer or seasonal residents. But, these retired business men represent the cream of the industrial experience and brains of the past generation, and not to make some better use of them is a genuine loss to society.

The New Philosophy

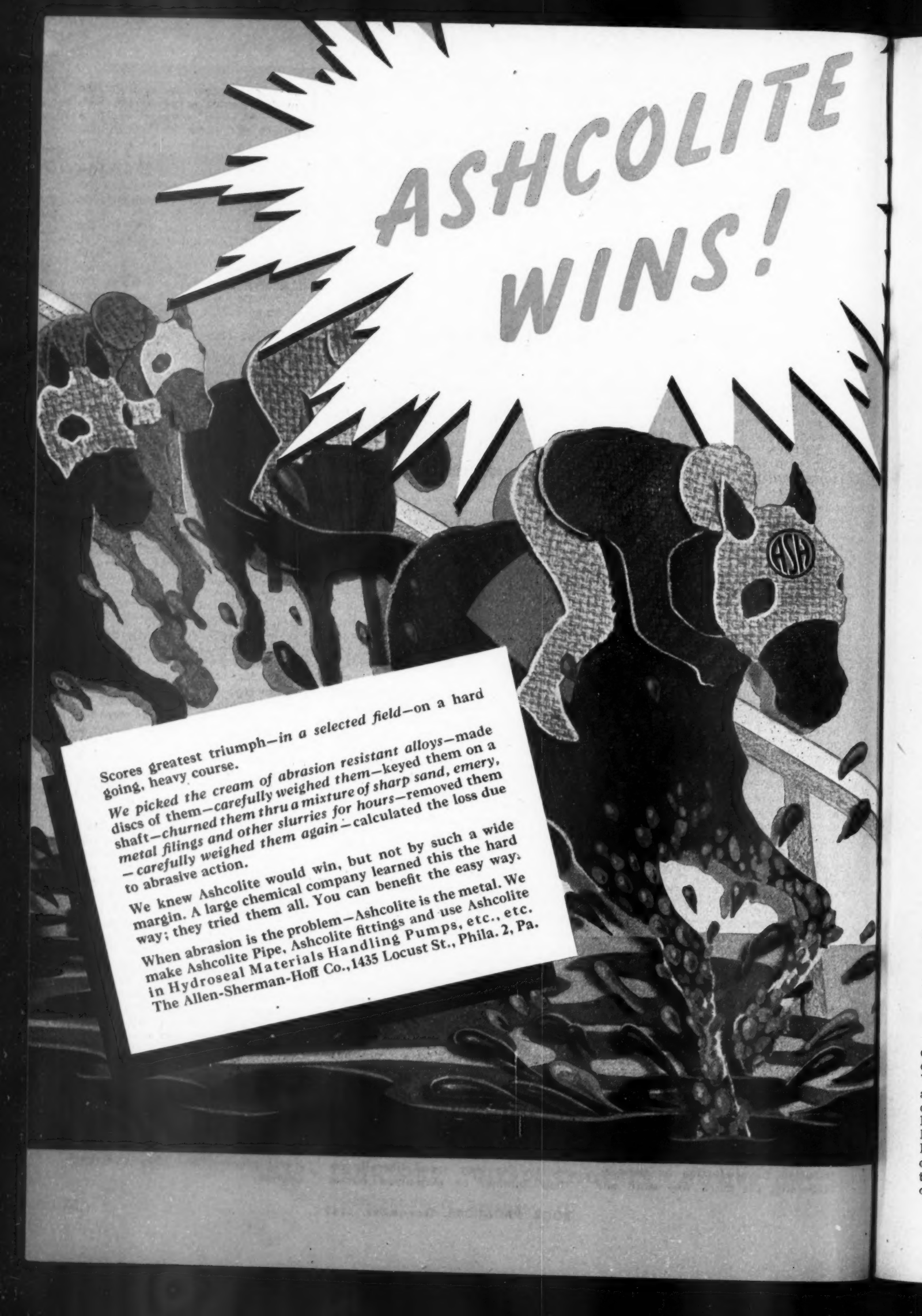
It is true, probably, that our modern doctors of philosophy look on the retirement of the older generation of business executives with glee, because these old timers have stood between the new theories of economic philosophy and its more complete practice. The new economists believe the great bulk of the population too dumb to look after themselves, and hence the federal and state governments must take care of their "social security." Thrift is no longer necessary or desirable, because your government will provide for you against all hazards!

It's hard for the old timers who have fought their way to the top, or at least near to the top, to accept that kind of economics. They know human nature too well, or they never would have achieved success in directing the work of others. They know that when you remove the incentive, or the necessity for thrift, you remove the chief incentive for making one's work acceptable. So, that is probably one reason why it takes two or more new executives to do the work of the old retired one. And if that kind of a philosophy prevails in the U.S.A., probably most of the old timers expect to see the whole economic structure crash some day. They only hope it won't be in their lifetimes.

Personally, we are not so pessimistic, possibly because we have much less to lose. We believe the economic problems can be solved, but these must be faced more frankly and honestly than has been done by the men with the brains and experience to tackle them. The younger generation must somehow be made to understand and appreciate the burden that is being thrust upon them; and no better way could be found than to have them come to respect their elders for experience and accomplishments, and for at least a part of the economic philosophy they knew and practiced.

It surely is all wrong for a school of new economists with government backing to spread the idea that these old timers are out of step with social progress. Don't ever forget that the present rising generation owes its present opportunities to the things the old timers did in their own way for social progress and industrial development.

ASHCOLITE WINS!

A stylized, high-contrast illustration of a horse race. In the foreground, a dark-colored horse with a white saddle cloth featuring the 'ASH' logo is galloping towards the right. Behind it, several other horses are visible, some appearing to be in various states of disrepair or being overtaken. The background is filled with jagged, lightning-like shapes, suggesting speed and competition. The overall style is reminiscent of mid-20th-century industrial or promotional art.

Scores greatest triumph—in a selected field—on a hard going, heavy course.

We picked the cream of abrasion resistant alloys—made discs of them—carefully weighed them—keyed them on a shaft—churned them thru a mixture of sharp sand, emery, metal filings and other slurries for hours—removed them—carefully weighed them again—calculated the loss due to abrasive action.

We knew Ashcolite would win, but not by such a wide margin. A large chemical company learned this the hard way; they tried them all. You can benefit the easy way.

When abrasion is the problem—Ashcolite is the metal. We make Ashcolite Pipe, Ashcolite fittings and use Ashcolite in Hydroseal Materials Handling Pumps, etc., etc. The Allen-Sherman-Hoff Co., 1435 Locust St., Phila. 2, Pa.

the *Personal Side* of the news

Assists Manager

CHARLES F. COLLEY, plant engineer and safety supervisor at the Hannibal, Mo., plant of Universal Atlas Cement Co., New York, N. Y., has



Charles F. Colley

been appointed assistant plant manager. Mr. Colley, a graduate of Tri-State College, Angola, Ind., began working for the company in 1916 as a civil engineer at the Hannibal plant. During the first World War he served as a First Lieutenant in the Coast Artillery and in 1919 returned to the Hannibal plant as an engineer. In 1928 he was appointed plant engineer and safety supervisor which position he has filled until his appointment as assistant plant manager.

Resigns

JACKMAN PALMATIER has resigned as general manager of the Grand Rapids Gravel Co., Grand Rapids, Mich., but will inactively continue his association with the company as secretary and director. NICHOLAS H. BATTJES, president, and son of the late Henry N. Battjes will succeed Mr. Palmatier as general manager. Other officers of the company are Dewey B. Battjes, vice-president, and Leo B. Dice, treasurer.

Institute Geologist

JOHN EMSLEY FUNNELL, research ceramist in the products development department of the Corning Glass Works, Corning, N. Y., has accepted appointment as ceramic engineer and economic geologist at the Midwest Research Institute, Kansas City, Mo. Mr. Funnell's first duties with the Institute will be in the inorganic chemistry section in connection with the investigation of natural resources of the states of Arkansas and Okla-

homa. His work will include the study and examination of metallic and non-metallic mineral resources occurring in these areas for the purpose of suggesting new uses for these raw materials and possible establishment of new industries.

Engineering Instructor

EDWARD MARTINEZ has been appointed instructor in mining engineering at Lafayette College, Easton, Penn. He received the degree of Bachelor of Arts and Bachelor of Science from Columbia University in 1944 and the degree of Engineer of Mines from the Columbia School of Mines in 1947. Mr. Martinez was born in Bogota, Columbia, but at a very early age moved with his parents to New York City. He served as radio technician in the United States Navy for two years during the war. Mr. Martinez is a student associate of the American Institute of Mining and Metallurgical Engineers.

Joins Ideal in Denver

DAVID O. HOWE, construction and maintenance supervisor at the Cape Girardeau, Mo., plant of the Marquette Cement Manufacturing Co., Chicago, Ill., has resigned to accept a similar position at the Ada, Okla., plant of the Ideal Cement Co., Denver, Colo. Mr. Howe is the son of J. H. Howe, plant superintendent at Cape Girardeau.

Comptroller

PAUL E. DUNCAN, assistant to V. J. Hanley, secretary-treasurer of the Marquette Cement Manufacturing Co., Chicago, Ill., has been appointed



Paul E. Duncan

comptroller of the company. Mr. Duncan has been employed by Marquette since 1933, first at the Oglesby, Ill., plant and later at the general offices in Chicago, Ill.

Honored for Services

HERBERT W. OVERLEY and EDWARD J. CRANDALL, Louisville Cement Co., Louisville, Ky., were honored recently by being presented with gold service pins by Eugene Hill, president of the company, at a dinner which was attended by about 35 executives and supervisory personnel. Mr. Overley, general auditor, joined the company 60 years ago, and Mr. Crandall, assistant traffic manager, has been with the firm for the last 40 years.

Organizes Engineering Firm

REUBEN J. SCHUMACHER, for 25 years chief engineer for The Kelley Island Lime and Transport Co., Cleveland, Ohio, has organized an engineering service for the rock products industry known as Basic Engineering Associates, with headquarters in Toledo, Ohio. The firm is affiliated with Arnold and Weigel, lime plant engineers, Woodville, Ohio. Mr. Schumacher designed and built all Kelley Island's new plants constructed during his association with the company, and also redesigned and modernized existing operations. He left the company in 1942 to join the Material Service Corp., Chicago, as chief engineer. Later he became associated with the Budd Co. as a development engineer, from which position he resigned this summer.

N.L.A. Engineer

WILLIAM T. HARVEY has joined the staff of the National Lime Association, Washington, D. C., as a chemical engineer. He is completing his work at the Virginia Polytechnic Institute preparatory to receiving his Master's Degree in chemical engineering, which was interrupted by the war. Mr. Harvey's work with the Association will consist of market research work, publicity, and field work on the chemical and construction uses of lime.

Chemical Engineer

ORIEN U. VAN DYKE, formerly with the Philadelphia Quartz Co., Philadelphia, Penn., has become associated with the Magnet Cove Barium Corp., Houston, Texas, as a chemical engineer.

Research Manager

FRANKLIN P. GOETTMAN has been appointed research manager for George F. Pettinos, Inc., Philadelphia, Penn.

Join Pipe Firm

FRED W. MORSE and FRED W. PLAPP, both of Worthington, Ohio, have joined the engineering staff of the Universal Concrete Pipe Co., Columbus, Ohio. Mr. Morse is a native of Columbus and attended Ohio State University. He was formerly a hydraulic machine designing engineer for a firm in Worthington. Mr. Plapp, a native of Chicago, Ill., and a graduate of Purdue University school of engineering, was formerly in the production control section of Curtiss-Wright, near Columbus, where he has resided for the past eight years.

P.C.A. Training Course

JOHN A. RUHLING, manager of the housing and cement products bureau of the Portland Cement Association, Chicago, Ill., has been appointed manager of technical personnel training in the fundamentals of concrete making and concrete construction practices. Carl A. Menzel, research engineer since 1928, will succeed Mr. Ruhling as manager of the housing and cement products bureau.

Mr. Ruhling has had nearly 30 years' experience in various fields of construction involving uses of portland cement concrete. He received his engineering training at Armour Institute of Technology and held important assignments with the Sanitary District of Chicago and the Bridge Division, Chicago Board of Public Works. He was administrative assistant to the general manager of the Century of Progress Exposition just prior to joining the Association staff in 1933 as a field engineer in the Milwaukee office.

C. A. Menzel has had more than 30 years' experience in scientific research and development work relating to con-



Carl A. Menzel

crete, steel, brick and other building materials. Prior to joining the Portland Cement Association, he was in charge of fire tests on building materials at the Underwriters' Laboratories in Chicago. He is author of many published scientific papers. Mr. Menzel's most recent work has been in the development and study of apparatus and field methods for determining the air content of freshly mixed concrete.

Visits Middle West

ROBERT MITCHELL, president of Consolidated Rock Products Co., Los Angeles, Calif., had a vacation for the first time in ten years. He spent it in the Middle West, combining business with pleasure. After attending the board of directors' meeting of the National Sand and Gravel Association and the National Ready Mixed Concrete Association at French Lick, Ind., he and his family visited the Lincoln historical spots in southern Illinois, returning to California by way of the trail traversed by the Mormons over 100 years ago.

Association Officers

THOMAS P. NASH, owner and operator of the Bellingham Builders Supply Co., Bellingham, Wash., has been elected a director and president of the Concrete Pipe and Products Association, increasing the membership to five. Other officers are GEORGE P. DUECY, partner in Associated Sand and Gravel Co., Everett, vice-president; A. B. METCALF, manager, Columbia Concrete Pipe Co., Wenatchee, secretary-treasurer; TALBOT CAMPBELL, owner and manager of the Seattle Concrete Pipe Co., Seattle, director; and F. M. KETTENRING, manager, Graystone Concrete Products Co., Seattle, director. Mr. Kettenring was

president of the Association for several years and is now quite active in the National Concrete Masonry Association.

Vice-President and Manager

ROYAL E. FOWLE has been appointed vice-president and manager of the Granite Rock Co., Watsonville, Calif., to succeed A. J. Wilson who has resigned. Mr. Fowle has been associated with the company for the past 18 years as civil engineer and manager of the Logan, Calif., quarry plant. He attended Ohio State University and the California Institute of Technology, and is a member of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Concrete Institute, and American Society for Testing Materials. Mr. Fowle has written many articles, some of which have appeared in recent issues of ROCK PRODUCTS.

Serves on Election Board

CHAUNCEY N. CORBETT, owner of a sand and gravel plant near Zanesfield, Ohio, has been chosen by the Logan County Republican Executive Committee to serve as a member of the Logan County Election Board.

Association President

W. R. BONSAI, JR., president of the Lawrence Stone and Gravel Co., Columbia, S. C., has been elected president of the South Carolina Concrete Masonry Association.

Operating Manager

WILLIAM H. KLEIN has been appointed operating manager of the Lawrence Portland Cement Co., New York, N. Y., with headquarters at Northampton, Penn.



John A. Ruhling



William H. Klein

Engineers at Ideal

ROBERT E. MARSH, design engineer at Ideal Cement Co., Denver, Colo., has been promoted to plant engineer at the Boettcher, Colo., plant. ROBERT H. FERGUSON, also design engineer at Denver, has been made project engineer at the Devil's Slide, Utah, plant. GUY FRIDAY has been appointed plant engineer at Portland, Colo. He was formerly engineer at the Mobile, Ala., plant. GLENN HORLBECK, formerly design engineer at Denver, has been named project engineer at the Portland, Colo., plant.

Assists Vice-President

SAMUEL KRAJCI, formerly technical assistant to the works manager at the Marrero, La., plant of The Celotex Corp., Chicago, Ill., has been promoted to the position of assistant to the vice-president in charge of production. Mr. Krajci, who served for a time as research associate at the National Bureau of Standards in Washington, D. C., will make his headquarters at Chicago, Ill.

Traveling Auditor

HUGH WALKER, chief clerk at the Bonner Springs, Kan., plant of Lone Star Cement Corp., New York, N. Y., has been promoted to traveling auditor with headquarters in New York City. He has been with the company for 21 years, starting at the Green Castle, Ind., plant. JAKE HICKS, who has five years of service with the company, will succeed Mr. Walker as chief clerk at Bonner Springs.

Named Vice-President

OSCAR E. BENSON, who recently became assistant to the president of the General Crushed Stone Co., Easton, Penn., has been appointed vice-president and general manager. A news item concerning Mr. Benson's appointment as assistant to Otho M. Graves appeared in the July issue of ROCK PRODUCTS.

Chief Chemist

ROBERT K. THOMAS has been appointed chief chemist of the Bellefonte Division of Warner Co., Philadelphia, Penn., to succeed David E. Washburn, who passed away September 20. Mr. Thomas has been with the American Lime and Stone Co., now the Bellefonte Division, since 1935.

Joins Construction Firm

JOSEPH B. GILLENWATER, formerly with the U. S. Gypsum Co., at Southard, Okla., is now assistant superintendent of the Bailey Construction Co., Thomas, W. Va.

Public Relations Director

FRANK W. TAYLOR, formerly assistant publisher of the *Chicago Sun*, has

been appointed public relations director of The Celotex Corp., Chicago. Before coming to Chicago six years ago he had been managing editor and a director of the *St. Louis Star-Times*.

Supervising Engineer

W. D. HUBLER, formerly vice-president and Canadian manager of the American Nepheline Corp., Rochester, N. Y., has been appointed supervising engineer of the Bo Products Corp., Rochester, N. Y.

OBITUARIES

ARTHUR J. WELLINGTON, founder and treasurer of the Massachusetts Broken Stone Co., Weston, Mass., died September 19 at the age of 87. He had been actively engaged in the business, which he founded in 1890, until his death.

HENRY M. WASEM, president and one of the founders of the Wasem Plaster Co., Fort Dodge, Iowa, died September 4. He was 62 years of age.

JAMES R. HERRON, former owner and manager of the Independent Cement Works, Atlanta, Ga., died September 11. He was 76 years old.

HARRY ANDERSON, electrical superintendent of the Kosmos Portland Cement Co., Kosmosdale, Ky., died September 4. He was 66 years of age.

JAMES G. PRIE, general manager of the J. K. Pirie Estate quarry in Barre, Vt., which was founded by his father many years ago, passed away September 4 at the age of 62.

FRANK EDWARD CONLEY, retired president and founder of the Frank E. Conley Stone Co., Utica, N. Y., died recently at the age of 75. Mr. Conley organized the stone business in 1898 in Higginsville, N. Y. He expanded the firm and operated a number of quarries producing crushed stone for many state road and construction jobs.

WILLIAM B. KING, who for many years conducted a concrete block plant in Watervliet, N. Y., died recently. The business had been started by his father in 1922.

JOHN G. LIND, vice-president, general manager and purchasing agent of St. Mary's Cement Co., Ltd., Toronto, Canada, died recently at the age of 80. Mr. Lind started his career in the cement industry in 1903 when he became interested in the Grey and Bruce Cement Co. in the Owen Sound area, becoming the principal owner a few years later. He adopted the wet process of making cement which used limestone rock as a base instead of marl which had been used up to that time. Together with his brother-in-law, A. G. Larrison, who was then chief chemist with the Durham Cement Co., he surveyed various sites in Ontario where limestone rock and clay were available. In 1910 he decided that St. Mary's was the most suitable

position, and interested several Toronto business leaders in the formation of St. Mary's Cement Co., Ltd. In 1942, Mr. Lind retired from active direction of the company.

CHARLES F. MILLER, retired manager of the gypsum division of The Celotex Corp., Chicago, Ill., died October 3. He was 73 years old. Mr. Miller had been secretary and treasurer of the Cleveland Builders Supply Co., Cleveland, Ohio, until 1908, when he became president of the Darlington Brick and Mining Co., Darlington, Penn. He later headed the American Gypsum Co., Port Washington, Ohio, and was manager of the gypsum division of The Celotex Corp. until his retirement in 1940.

ROBERT A. PRUDEN, retired district manager of the Lawrence Portland Cement Co., New York, N. Y., died October 1 in Philadelphia, Penn. He was 67 years old.

HOWARD W. MAXWELL, former vice-president of the Atlas Portland Cement Co., now the Universal Atlas Cement Co., New York, N. Y., died suddenly on September 13 at his home in Glen Cove, N. Y. Mr. Maxwell became associated with the cement company in 1895 upon graduating from Princeton University, and remained until his retirement in 1929.

GUY B. BEABOUT, former president of the Muskingum River Gravel Co., Zanesville, Ohio, passed away suddenly September 19 at his home in Los Angeles, Calif. Mr. Beabout organized and was president of the gravel firm until 1930. At that time he was called to government service as chief engineer in the Vicksburg, Miss., district. For the past 11 years he had served as chief engineer in the Los Angeles district in charge of rivers and harbors. He was connected with defense work during World War II. Mr. Beabout just recently returned from a trip to Central America.

A. G. BUSSMANN, who had been in charge of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corp., New York, N. Y., died October 7 at the age of 61.

ARTHUR A. BELVILLE, a veteran of nearly 40 years of service with the Bemis Bro. Bag Co., Boston, Mass., passed away recently.

DAVID E. WASHBURN, chief chemist of the Bellefonte Division of Warner Co., Philadelphia, Penn., and a well known figure in the lime industry, passed away September 20. He was 64 years old. A graduate in chemistry from Penn State University, Mr. Washburn served as a chemist for the charcoal iron industry in the Bellefonte area prior to becoming chief chemist for the American Lime and Stone Co. (now Warner Co., Bellefonte Division) in April, 1922. For many years he was a member of the Chemical Society and of the American Society for Testing Materials.

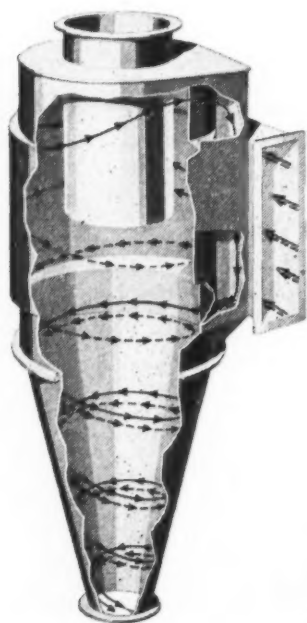
P R E V E N T I N G

Dust Losses

Pinning one's faith to a proposed dust collection system is no casual matter. You want to be as sure of the engineering as you are of the equipment itself...Buell has a wealth of experience to lay on the line, and 100% of it in this specialized field. Fundamental, too, is the fact that each and every Buell installation is engineered and built for the special conditions under which it is

to operate. Therein lies the secret of high-efficiency performance — and of greatest value per dollar of cost. To know Buell better, you ought to read the 32 pages of frank discussion in our new catalog.

*Write: Buell Engineering Co.,
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Engineered Efficiency in **DUST RECOVERY**



Association NEWS

BY the time this issue goes to press, the I.C.C. in all probability will have granted and placed in effect the emergency 10 per cent across the board increase in freight rates which the railroads have requested. No particular protest will be voiced against this increase as everyone concedes that if the railroads are to continue to give adequate service, they must have sufficient compensation to pay increased costs arising from the recent boosts in wage rates and the rising prices paid for materials.

There is, however, strong objection to the increases which would amount for the entire country to a 22.5 per cent increase in railroad revenue. Proposed increases in freight rates, for example, go as high as 38 per cent for industrial sand in Official territory. If these discriminatory rates go into effect, there will undoubtedly be a sharp decline in the average rail haul of this commodity, and a very large diversion to water and truck haulage.

Banner Year for Liming Materials

National Lime Association's annual report on all liming materials shows that the total consumption for 1946 amounted to 29,462,200 tons, an all-time high for the industry. The Agricultural Limestone Division of the National Crushed Stone Association co-operated in the compilation of this data. The 1946 figure represents an increase of about 32 per cent over the 22,357,403 tons consumed in 1945. Nearly all of that increase is agricultural limestone as the use of other liming materials was about the same for the two years. Illinois continues to ring the bell as the largest consumer of agricultural limestone with a figure of 5,350,195 tons. This tremendous tonnage for one State is particularly significant when it is noted that it is nearly as much as the combined consumption of all the Northeast and East Central States combined. Iowa is next in line with a total of 3,337,155 tons followed by Indiana with 2,686,230 tons and Missouri with 2,567,846 tons. Pennsylvania with a total of 1,311,032 tons of agstone led the Northeast section, and Tennessee with 1,100,000 tons was in front in the East Central section.

Sand and Gravel Short Course

STANTON WALKER, director of engineering, National Sand and Gravel Association, has announced that tentative arrangements have been completed to hold a second Short Course

of Instruction for sand and gravel technicians at the University of Maryland. This course will be held during the period from November 17 through November 22. Members have been requested to announce as quickly as possible whether they will be represented. The course this year will be sponsored jointly by the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

This year's course will be restricted to discussions of problems involved in the design of concrete mixtures. This narrower scope curriculum will permit intensive and detailed instruction. Last year the instruction consisted of lectures and laboratory demonstrations.

Freight Rate Protests

In the pending Ex Parte 166 freight rate case before the I.C.C., the National Crushed Stone Association, National Slag Association, and National Sand and Gravel Association will present separate statements. Heretofore, these associations have joined in presenting their case. It is understood that the National Slag Association will indorse an increase expressed only in flat cents per ton, assuming that the I.C.C. will impose an increase on every commodity regardless of the force of its presentation in Ex Parte 166. It is also understood that the National Crushed Stone Association will not take a position on the question of percentage increase versus flat increases in cents per ton. In other respects, the National Sand and Gravel Association will present a statement substantially the same as the crushed stone association.

Long Range Program of Abundance

SECRETARY ROBT. M. KOCH of the National Agricultural Limestone Association, Inc., recently reported to the membership of his association on the joint hearings held by the House Agriculture Committee and the Senate Agriculture Committee on the formulation of a long-range agricultural policy. The Department of Agriculture had five subjects to present to these hearings, but the topic of particular interest to agricultural limestone producers was "Conservation and Land Use Adjustments" by O. V. Wells, chairman of U.S.D.A. Committee on Conservation and Land Use Adjustments and Chief of Bureau of Agricultural Economics.

Mr. Wells pointed out that this country had depleted its basic wealth faster by far than any other nation in history. He said, "Another century and a half of equal waste could make the United States an historical 'has been,' unable to feed its own people adequately, much less to use its food and fiber, as now, to encourage peace and democracy on the earth." Referring to the long-range program envisioned by Secretary of Agriculture Anderson, he said, "We are hardly more than started on such an over-all program now. Our Soil Conservation Service estimates that half of the cropland we are using this year is subject to erosion in greater or lesser degree. Despite more than a decade of widespread application of lime and phosphate and the use of such practices as contour farming, strip-cropping, terracing, and turning under green manure, the land still needs an intensification in the use of all of these materials and practices. Every year erosion and depletion still rob us of productivity on hundreds of thousands of acres." Secretary Robt. M. Koch of the National Agricultural Limestone Association said that while everyone is for the conservation program, there continues to be a divergence of opinion as to whether this program will be sustained without some form of incentive payments. This association believes that while education and technical assistance are essential, direct payments and the furnishing of conservation materials are "just as much public investments in conservation as are public expenditures for education and for technical assistance to farmers."

No Portal-to-Portal Suits

Executive Secretary, V. P. Ahearn of the National Sand and Gravel Association, in a bulletin to the membership pointed to the significance of September 11, 1947, under the so-called Portal-to-Portal Act. One of the important accomplishments of the Portal-to-Portal Act was that after a grace period of 120 days, a uniform Federal statute of limitations was established for causes of action arising under the Wages and Hours Act. That grace period came to an end on September 11, 1947. The statute of limitations will bar any new suits asserting a claim for failure to pay time-and-one-half for overtime under the Administrator's theory of coverage first announced in March, 1945, in Mr. Walling's release A-14.

DAY-AND-NIGHT WORK PROVES



**"EFFECTIVE
LUBRICATION"
REDUCES
MAINTENANCE
COSTS**

WHEN machines must run on round-the-clock schedules, that's when you need "effective lubrication" — the ability of your lubricant to *stay in the bearings* despite heavy loads and rough service . . . to give extra long hours of protection. And for that, nothing beats *Texaco Marfak!*

Marfak is tops for bearings in truck chassis, tractors, bulldozers, shovels and other equipment — a tough, tireless lubricant that gives *longer lasting* protection because it prevents rust and seals out dirt and moisture. Saves you money on maintenance costs.

In wheel bearings, *Marfak Heavy Duty* forms a fluid lubricating film inside, retains its original consistency at the outer edges . . . thus sealing itself in, sealing out contaminants . . . assuring longer lasting protection with no need for seasonal change.

For engines — heavy-duty gasoline and Diesel — *Texaco Ursa Oil X*** assures top efficiency and econ-

omy. *Ursa Oil X*** is fully detergent . . . dispersive . . . highly resistant to oxidation. It keeps engines clean.

Save time and money by using the Texaco Simplified Lubrication Plan. For full details, call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



MAKE THIS SIMPLE TEST: Put a little *Marfak* in the palm of your hand. Rub it with a circular motion and notice how it liquefies to a fine oiliness under friction while retaining its original tough consistency in the surrounding "collar." Just so, in a bearing, *Marfak* lubricates wearing surfaces, while its "collar" seals out destructive dirt and moisture, assuring longer bearing life.



TEXACO Lubricants and Fuels

Tune in . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. See newspaper for time and station.



INDUSTRY *News*

Lime Association Safety Competition

INJURY SEVERITY RATES fell 38 per cent in 1946 at the 36 plants competing in the Twelfth National Lime Association Safety Competition, according to the Bureau of Mines. This represents an average of 2.925 days lost per 1000 man-hours of work as against 4.692 in 1945, and a decline of 31 per cent from the 12-year average of 4.240. However, occurrence of injuries increased to 34.203 per million man-hours in 1946 over 30.226 in 1945 and showed a gain over the 12-year average frequency of 33.986. Asbury plant of the Standard Lime & Stone Co., Knoxville, Tenn., received a Certificate of Honor for being the only plant in the competition to complete the year without one lost-time accident. Average man-hours worked per plant were 194,102, setting a new high.

Mica Plant Relocates

NEWPORT NEWS, Va., is the location chosen by Asheville Mica Co., Asheville, N. C., for consolidation of operations. A seven-acre site has been purchased and work has begun on two of six buildings ultimately planned for this site. Some machinery for the new plant will be moved in from the Asheville property, although the company will continue to operate the Asheville plant. Subsidiaries of the parent company include: Asheville Schoonmaker Mica Co., N. Y.; Richmond Mica Corp., Richmond, Va., and the Mica Company of Canada, Ltd., Massena, N. Y.

Gravel Pit Suit Won

JOHN D. GREGG Co., Roscoe, Calif., was granted the right to continue operation of its sand and gravel pit when a Superior Court judge denied an injunction to prevent the company from increasing excavations to a 1500 acre site adjacent to its present 115 acre operation. The injunction had been filed by nearby residents who claimed that the company's operation had caused \$350,000 worth of damage to their real property. The John D. Gregg Co. was ordered by the court to not operate the pit at night, to completely house the crushing station and to wet-down the drag-line at all times.

Added Rock Wool Capacity

CELOTEX CORP., Chicago, Ill., recently announced major expansion plans for four of the company's insulation plants. According to Bror Dahlberg,

president, building is the country's greatest industry today, and expansion of company plants is an effort to meet the great demand for home insulation, rigid insulation board, acoustical building materials, and gypsum and roofing materials. The plants being altered for greater capacity include Cleveland, Port Clinton and Avery, Ohio; and Lagro, Ind.

Bentonite Plant Aids Electrification Plan

BLACK HILLS BENTONITE, INC., Moorcroft, Wyo., as announced by A. C. Harding, general manager, recently agreed to a contract with the Rural Electrification Administration that will make a guaranteed load of sufficient size to assure the extension of the line from Gillette, thus assuring the county of power. The bentonite company inserted a clause in the contract to the effect that unless the power was provided before November 1, 1947, the contract would automatically become void. When the line was not completed by June 1 as originally planned, the company had been forced to install its own power generating equipment, which, Mr. Harding said, should provide adequate power for the next few years.

Million-Dollar Gypsum Plant

SID H. ELIASON, president, Western Gypsum Co., Salt Lake City, Utah, announces that progress is being made

in the erection of the company's \$1,000,000 plant at Sigurd, Utah. The new plant will be used for conversion of white alabaster into gypsum board and related products.

Vermiculite from Africa

TOTAL OUTPUT of a new northern Transvaal vermiculite mine has been contracted for by an American producer. The American firm stated that the African ore was of a much higher grade, and in addition, labor costs in the African mines are about one-twentieth the American costs. The 1947 output is expected to equal about 25,000 tons; but by 1948, when American machinery has been installed, production is expected to jump to about 180,000 tons (total American production in 1946 was 75,000 tons).

Large Dredging Operation

TRI-STATE MATERIALS Co., Charleston, W. Va., recently started operation of a sand and gravel dredge in the Ohio river near Racine at the site for a new power plant. A self-contained unit, the dredge delivers washed and graded material to barges.

Phosphate Mine Purchased

DURING THE YEAR Davison Chemical Corp., Baltimore, Md., expended over \$4,000,000 in the purchase and improvement of phosphate rock mining properties in Florida and the erection of a catalyst manufacturing plant in Cincinnati, Ohio.

AAA LIME PROGRAM HAS BEEN REINSTATED

Fortunately we have a stock-pile of 4,600 tons and can make immediate deliveries.

THE LATEST OFFICIAL AAA TEST (July 16)

RATED US AT 99.2 CaCO₃ (Lime)

with 89% passing an 8-mesh screen and 28% passing a 100-mesh 1,500 pounds of CaCO₃ (lime) testing 100% is worth a ton of lime testing only 75%.

If you want to get the Best Lime in Allen County, suggest to your truck driver to get your lime at—

VANHYNING LIMESTONE QUARRY

LOCATED AT CONCRETE LAKES, NORTHEAST OF GAS CITY

Postal card notice sent out by Van Hyning Limestone Quarry to every farmer in Allen County

Add Truck Fleet

GENEROSO POPE, president, Colonial Sand & Stone Co., Inc., New York City, announced recently the acquisition of all the capital stock of James A. Norton, Inc., operators of a truck fleet. Mr. Pope stated that the truck company will continue to operate as a separate unit and under its former management.

Sand-Lime Brick Plant

WASHINGTON BRICK and Lime Co., Spokane, Wash., recently began operation of its new Dishman sand-lime brick plant that introduces a new

building material to the area. An autoclave of 16,250 brick capacity has been installed which cures brick under 125-lb. steam pressure in about 12 hours. Rupert Smith is superintendent of the new plant and C. E. Blackburn, who worked on early stages of plant construction, is a company district representative. Both men served overseas in the Marine Corps with Neal Fossen, president, Washington Brick and Lime Co.

Quarry Reopened

AFTER STANDING IDLE for 17 years, Concrete Materials Co., Sioux Falls, S. D., is reopening a large quarry for

the production of road stone and ganister. Increased demand for the company's ganister by steel mills and refractory brick companies made the small quarry the company has been operating since 1930 inadequate. At time of reopening, the quarry had been completely re-equipped. All crushing and screening equipment was supplied by Nordberg Manufacturing Co. New equipment also includes three 6-in. Bucyrus-Erie electric churn drills, a 2½-cu. yd. shovel of the same make, and two 5-ton International end dump trucks are supplied for the haul from shovel to primary crusher that is located on the quarry floor. A 36-in. belt conveyor, 280 ft. centers, elevates the material from the primary to the secondary screening and crushing station on ground level.

Overburden averaging 4-ft. contains 99 per cent silica and is removed by scrapers and power shovels. The principal deposit is of quartzite stone. The new plant has a capacity of 150 ton per hour.

Reaward Safety Trophy

HANNIBAL, Mo., plant of Universal Atlas Cement Co., New York City, won the Portland Cement Association safety award for the third time when it was recently presented to the company for "no lost-time accidents" in 1946. Previous years that the plant has had the same record were 1939 and 1935. The event was marked with a day-long celebration, with the presentation of the award being made on the plant lawn, followed by a picnic and plant inspection for guests, employees and their families.

Start Sand, Gravel Plant

N. J. JELSON and Son have begun operation of a new sand and gravel processing plant at Albert Lea, Minn. The plant will produce material for road surfacing, aggregates and concrete block manufacture. The Jelsons have operated the pit in the past only for recovery of road stone.

Seek Dredging Permit

AULVIN & PITZER, Albion, Ill., has made application to Col. B. B. Talley, district Army engineer at Louisville, Ky., for permission to dredge sand and gravel from the Wabash river for commercial purposes.

Pavement Yardage

AWARDS of concrete pavement for September and for the first nine months of 1947 have been announced by the Portland Cement Association as follows:

	Square Yards Awarded	
	During First 9 Months of 1947	
	During Sept., 1947	
Roads	1,132,720	16,547,045
Streets and Alleys....	1,464,080	11,837,932
Airports	162,724	1,250,222
Totals	2,759,524	29,635,199

Coming Conventions

American Concrete Pipe Association, 40th Annual Convention, Hotel Roosevelt, New Orleans, La., March 11-13, 1948.

American Concrete Institute, 44th Annual Convention, Denver, Colo., February 23-26, 1948.

American Road Builders' Association, 45th Annual Convention, Washington, D. C., January 26-28, 1948.

American Road Builders' Association, Exposition of new Construction Equipment, Soldier Field, Chicago, Ill., July 16-24, 1948.

American Society for Testing Materials, Annual Meeting and Exhibit of Testing Apparatus and Related Equipment, Book - Cadillac Hotel, Detroit, Mich., June 21-25, 1948.

American Society for Testing Materials, Committee Week and Spring Meeting, Washington, D. C., March 1-5, 1948.

Agricultural Lime-stone Division of National Crushed Stone Association, 3rd Annual Convention, Netherland Plaza, Cincinnati, Ohio, January 29-30, 1948.

Chemical Industries Exposition, Grand Central Palace, New York, N. Y., December 1-6, 1947.

National Agricultural Limestone Association, 3rd Annual Convention, Hotel Statler, Washington, D. C., January 14-15, 1948.

National Concrete Masonry Association, Directors' Meeting and South-eastern Region Meeting, Roosevelt Hotel, New Orleans, La., November 8-11, 1947.

National Concrete Masonry Association, Annual Meeting, Hotel New Yorker, New York, N. Y., March 1-3, 1948.

National Crushed Stone Association, 31st Annual Convention and Exposition, Netherland Plaza, Cincinnati, Ohio, January 26-28, 1948. Exposition January 26-30.

National Lime Association, Annual Convention, The Homestead, Hot Springs, Va., April 4-6, 1948.

National Sand and Gravel Association, 32nd Annual Convention, Netherland Plaza, Cincinnati, Ohio, January 20-22, 1948.

National Ready Mixed Concrete Association, 18th Annual Convention, Netherland Plaza, Cincinnati, Ohio, January 21-23, 1948.

Sand-Lime Brick Association, Convention, Roanoke Hotel, Roanoke, Va., January 26-28, 1948.

Magnesium and Calcium to Be Produced Commercially

UPON CESSATION of hostilities in the late war, New England Lime Co., Canaan, N. C., was the world's largest producer of calcium. Both magnesium and calcium produced by this company during the war were manufactured under government subsidy and in a War Assets Administration plant. When the War Department found it necessary to use large quantities of calcium, New England Lime Co. developed the thermal reduction process for supplying it more quickly and less expensively than could be done by the electrolytic method.

New England Lime is starting production on a small scale, but plans to expand as the market grows larger due to lessening amounts of surplus war scrap and increased demand through new uses for the metals being found. William J. Ash, works manager, states that the magnesium division of New England Lime Co. will be under the direction of J. F. Pozzi and the lime division will be under the supervision of C. J. Johnson.

Addresses Labor Meeting

FRANK MOYLE, director of operations at the Marquette Cement Mfg. Co., Chicago, Ill., appeared as guest speaker at the ninth annual district convention of the United Cement, Lime & Gypsum Workers International Union, held recently in Cape Girardeau, Mo., where he stressed sound employer-employee relations. Using his company as an example, he told the results gained by mutual understanding and cooperation between all elements of the business structure stating that intelligent teamwork guided America to the position it holds in the world today. "Intelligent teamwork—voluntary cooperation between all men—can be the only sure way to keep this place," he said.

Ag Lime Days Celebrated

DAVISS COUNTY (Mo.) soil district supervisors gave away 225 tons of agricultural limestone to farmers attending farm tours held in conjunction with a four day fete: "Best Use of Limestone." Agricultural limestone for the occasion was donated by the Frank Snyder quarry and the Case, Wilder & Hayes quarry, both of Galatin. A total of 15 tons of the agricultural limestone will go to two farmers in each of the county's 15 townships.

West Coast Cement Mills

DURING the first half of 1947, West Coast cement mills were operating at the highest level since 1942, year of the greatest wartime demand. Mills in the Pacific Northwest reported a gain of 28 per cent and output of California mills increased by 20 per cent.

California mills were operating at 89 per cent of rated capacity and mills in the north at 87 per cent of rated capacity. Mill stocks were low as demand almost exceeded supply.

Quarry Contract Suit

F. D. FOGLE, quarry operator near Ottawa, Kan., has been sued in district court by U. B. Daugharthy, owner of the land where the quarry is situated and holder of a contract calling for payment on the basis of cubic feet of rock removed. The site had been previously operated as a quarry and the owner claims that the new operator is selling loose chat, gravel and limestone processed prior to his operation. The owner also alleges that estimates of rock removed are too low.

Cement Plant Enlarged

TEN STORAGE BINS with a capacity of 10,000 bbl. of cement each are being erected at the Bonner Springs (Kan.) plant of Lone Star Cement Corp., New York City. Arnold Fairchild, superintendent of the plant, stated that the added storage bins were for special types of cement now being produced by the plant. Lone Star bought the Bonner Springs plant in 1922, and since that time has rebuilt almost the entire mill.

Limestone Reserve

SOLVAY PROCESS Co., a subsidiary of Allied Chemical & Dye Corp., recently purchased several hundred acres of land near Illmo, Mo., to be used as a limestone reserve. Construction plans are not expected to be made for several years, however.

Start Retarder Plant

CARL BIRO, JR., general manager of the Biro Manufacturing Co., Marblehead, Ohio, was recently elected president of the reorganized Roll Manufacturing Co., Lakeside, Ohio. The new company will manufacture plaster retarder, and the plant is being reopened after more than four years of idleness.

Explosives Control Ended

FEDERAL EXPLOSIVES controls which governed manufacture, sale, possession, storage, and use of nonmilitary explosives during World War II have been officially terminated by the President, bringing to an end more than five years of Government administration of the Federal Explosives Act. The Act was designed primarily to prevent the use of explosives for sabotage.

Organize Quarry Company

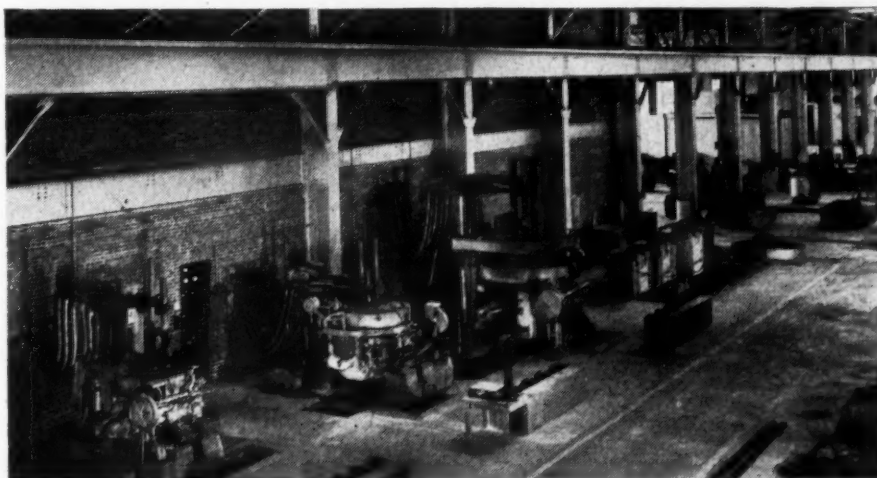
HARRY E. HANSEL, county engineer of Mahaska county, Iowa, is president of a newly formed corporation, the Vine Street Quarry, Inc., Oskaloosa, Iowa.

Dam Proposed

UNITED STATES CORPS of Engineers, Augusta, Ga., propose a dam at Clark Hill. Work involves dam construction and appurtenant works, concrete aggregates and slope protection.

Open New Plant

ELECTRO-ALLOYS Division of the American Brake Shoe Co., Chicago, Ill., has announced the opening of a new \$3,000,000 high alloy foundry at Elyria, Ohio. Members of the trade press throughout the country were invited to the opening ceremonies. The foundry is modern in every detail. All equipment is installed on concrete floors and the roof is covered with precast concrete slabs. Particularly striking features are the even diffusion of light to all parts of the building, and the tunnels, pipes and conveyor systems for sand handling and dust collecting equipment beneath the foundry floor. Present at the opening were J. B. Spencer, vice-president, Chicago; Paul Carroll, advertising manager, New York; C. J. Moorehead, public relations, New York; and J. R. Fesse, advertising department, New York. Also present were Walter Hoffman, president of Electro-Alloys, and William George, sales manager.



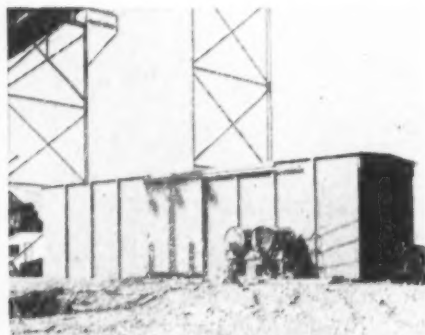
Looking down aisle of electro-alloy department. Battery of three electric furnaces to the left

HINTS *and* HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Steel Tool Shed

AT THE NEW PLANT of the Triangle Rock and Gravel Co. near San Bernardino, Calif., a fire-proof tool room and oil shed has been strategically lo-



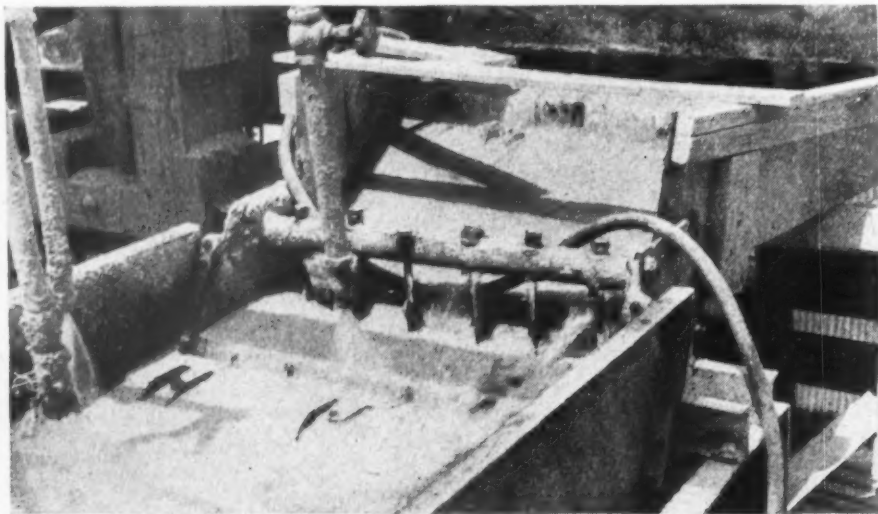
Steel tool room and oil storage shed made from steel box car

cated under a steel conveyor support. The novel feature of this tool shed is that it was the body of a steel box car, and so blends perfectly into the all concrete and steel plant.

Distributor to Screens

IN the old plant of the Nevada Silica Sands, Inc., at Overton, Nev., one step in the processing of washed glass sand is the use of a hindered settling device which acts to wash out and eliminate some of the undesirable clay particles.

As shown in the illustration, the device discharges through a series of short pipes in the background. The overflow (not shown) goes to waste. From the washer the sands pass to a vibrating screen, and to distribute the flow of pulp over the screen in an even manner a distributor was installed. The cross-member is a piece of pipe



Adjustable blade distributor for controlling feed to screen

with adjustable blades held tight in position by a nut. This simple device gives greater screen life and better screening efficiency.

Bucket Elevator Feed

THE MORTARLESS CONCRETE BLOCK Co., Albuquerque, N. Mex., has an interesting arrangement to feed a bucket elevator from bins on each side. As shown in the illustration, the two pits marked "A" and "B" are located along side of each other with the bucket elevator serving the block plant in between. Two hand levers actuate gates at the bottom so that the



Two bins, side by side, feed into bucket elevator in between. One bin contains sand and the other pumice

bucket elevator can be fed by gravity flow of material. It is simple but it does a good job with no expensive auxiliary equipment.

Oil Burner Aid

ONE OF THE PROBLEMS of an operator using a small capacity oil burner is to keep it burning without standing



Method of mounting oil burners for continuous burning in pea gravel drier

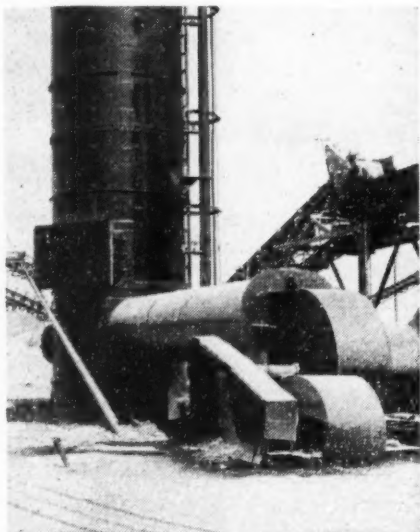
guard over it at all times. At the Radum plant of Henry J. Kaiser Co. (Bart Carter, superintendent) the plant is drying stockpiled pea gravel before reducing it to concrete sand in a Symons cone crusher. The drier is 3- x 16-ft. and is unlined, but has channel iron lifters. About 25 tons per hour is handled by the drier with an hourly fuel consumption of about 20 gal. Two Cook oil burners are used and low pressure air from a blower atomizes the oil. To secure continuous burning of the oil, two parallel steel pipes of 8-in. diameter are mounted at the end of the drier for burner supports. These pipes are about 1-ft. long and are installed as shown in the illustration.

Starting a Diesel Engine

DUE TO WAR CONDITIONS, a western operator was forced to buy an old Diesel for powering part of his plant. The engine had been overhauled in Los Angeles and shipped to the operator as being in perfect condition; but when installed at the plant, it refused to start. A mechanic from a nearby town was called in, but failed to locate the trouble. Finally, a mechanic was called in from the shop in Los Angeles where the engine had been overhauled. By the simple expedient of removing the exhaust pipe and applying a lighted blow torch to the exhaust manifold, the motor started. Each time thereafter the blow torch method was required to start the Diesel. Cost of bringing the mechanic in from Los Angeles: \$440. This may save other plants a like bill.

Hot Plant Dust Collector

Griffith Co., Los Angeles, Calif., recently completed a new sand and gravel plant in the Bakersfield area, and in conjunction with this construc-



Fan, lower right, draws hot-plant gases through cyclone and discharges to water spray and baffle tower of company's own design for almost total elimination of dust

tion in California's central valley the company installed a hot plant for preparation of asphaltic mixes. This state is enacting laws to control smoke and dust from industrial plants—but in this new plant the state legislators were beaten to the draw and before the so-called "smog" law was passed, smoke and dust from the hot plant was already controlled.

A 48-in. fan draws the gases through a cyclone dust collector first, and the design is such that the material recovered can be sent back to the mixer or hauled away in trucks for other disposal. Gases are then discharged by the fan into the base of a steel tower about 40-ft. high and 6-ft. in diameter. Water sprays and baffles in this tower function so well that when the hot plant is in full operation only a small amount of steam issues from the stack. The tower was salvaged from second-hand oil refinery equipment that is plentiful in this area of both old and new oil fields.

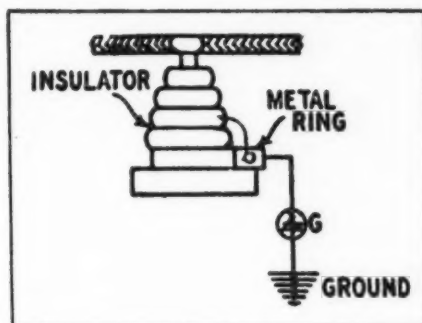
Neon Glow Lamp as Indicator Light

By PAUL C. ZIEMKE

NEON GLOW LAMPS can serve the mine or quarry electrician in a host of applications. When connected to a d.c. circuit, one half of the element glows while the remainder is unlighted. On a.c. circuits, both halves glow brightly, making the lamp a handy substitute for an expensive meter. These lamps require no transformer, resistor or ballast on the conventional 115-volt circuit, although they are re-

quired on higher voltages. Because of several limitations best known to manufacturers, glow lamps are only made in smaller sizes, yet this is no handicap since the application is usually on projects where space limitations would rule out larger wattage units.

A glow lamp may be used to serve as an indicator light on a cleat line or cable run by coupling it to the base of the insulator by a capacitance connection, by which the lamp glows in the presence of power. The bulb indicates any energized cable, establishing the approximate voltage by its brilliance; indicates a 25 cycle current by a pronounced flicker or 60 cycle a.c. by a steady glow of both



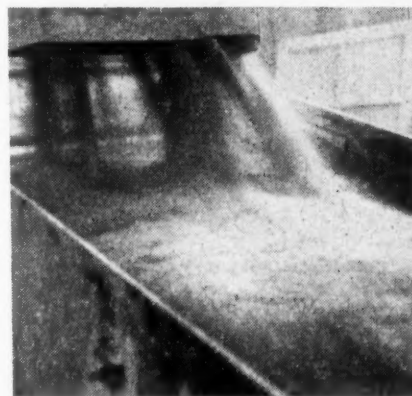
Glow lamp coupled to cleat line or cable run by capacitance connection to serve as indicator of amount and type of current

filaments; and indicates d.c. current by glow in one filament only. Polarity may be established by previously noting which half glows on a known polarity.

Ball Type Screens for Agricultural Limestone

ACCORDING to R. L. Snauffer, present operator and grandson of the founder of J. & L. Snauffer, Inc., quarry, Dublin, Ohio, ball type screens have proven themselves well suited for separation of damp agricultural limestone. This type screen carries rubber balls about the size of indoor handballs in compartments under its entire length, preventing blinding by being repeatedly thrown up against the mesh by the units gyrating motion.

A capacity of 35 t.p.h. is attained



Screening damp agricultural limestone product with "ball"-type screen to prevent blinding

by feeding minus 1½-in. material to a 20-in. center feed Gruendler hammer mill, set for ¼-in. grate bar opening, which discharges to a small (3- x 8-ft.) single deck Simplicity ball screen with 5/32-in. square mesh in a closed circuit. Finished product tests at 99.63 CaCO₃, and falls within the following size gradations:

Per Cent Passing	Screen Size
98.57	8
82.68	20
50.38	60
41.28	100

Portable Rock Crusher

KASER CONSTRUCTION Co., West Des Moines, Iowa, is operating a portable crusher at its Selma quarry, Ottumwa, Iowa. Present capacity of the plant is 800 tons daily, composed of 25 per cent road stone and 75 per cent agricultural limestone.

Quonset Covers Dredge

TERRY CARPENTER, LTD., has a modern sand and gravel plant at Scottsbluff, Nebr., and also operates ready mixed concrete and concrete block plants. For digging sand and gravel a 10-in. Amsco pump, driven by two D13000 Caterpillar Diesel engines, is used. The dredge has a 50-ft. Swintek digging ladder. The pump and engine assembly is mounted on a steel hull with the units protected by a Quonset Hut, making a neat, serviceable housing.



Quonset hut over dredge hull makes a good housing for equipment



MACHINERY

Tractor Attachment

HYSTER Co., Portland, Ore., has developed its Hystaway attachment for Caterpillar track-type tractors which combines a dragline, clamshell, and

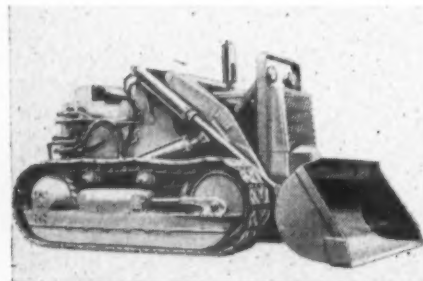


Attachment on tractor used in dragline service

crane with the mobility of a track-type tractor. It has been used on D6 and D7 Caterpillars, and now has been released for the larger D8 model. Specifications call for a 12-cu. yd. bucket on the D7 and D8 with a $\frac{3}{8}$ -cu. yd. bucket on the D6.

Dözer-Shovel

FRANK G. HOUGH Co., Libertyville, Ill., has designed its Model 14 bulldozer-shovel into the International



Bulldozer-shovel has bucket extending full track width of the tractor

TD-14 Diesel tractor. A large capacity, front-mounted hydraulic pump, directly connected to the engine crankshaft supplies power for all operations. By means of a single lever, the operator can raise, lower, hold or "float" the bucket or apply down pressure when hard digging is encoun-

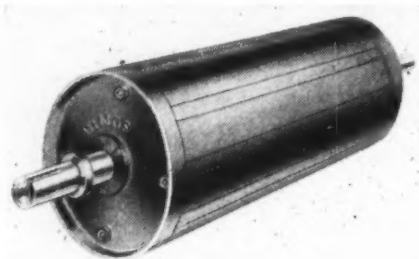
tered. In addition, the bucket may be dumped partially or completely at any height and returned by hydraulic power. An automatic bucket tip-back tilts the bucket back 38 deg. in carrying position to prevent spillage.

A full track width bulldozer blade can be attached in a matter of minutes, enabling the bulldozer-shovel to handle a wide variety of bulldozing jobs consistent with the size of the tractor.

Magnetic Pulley

DINGS MAGNETIC SEPARATOR Co., Milwaukee, Wis., has designed what has been termed the Perma-Pulley, a permanent magnetic pulley with Alnico poles. It is available in 53 sizes ranging from 12- x 12-in., to 30- x 60-in.

Designed for use as head pulleys in a belt conveyor system or in a self-

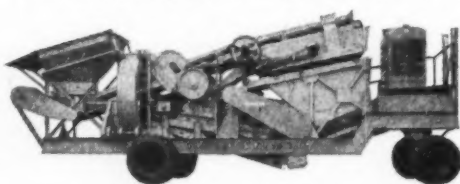


Permanent magnetic pulley has standard shaft diameter

contained magnetic pulley-type separator unit, these magnets are used to remove magnetic substances automatically from non-magnetic materials carried on the belt. As it has permanent magnet construction, no electrical wiring is required. The pulley has a crown face to prevent belt weaving and as an aid to distribute the burden across the belt as it passes over the pulley.

Portable Crushing Plant

GRUENDLER CRUSHER & PULVERIZER Co., St. Louis, Mo., has developed a complete crushing plant on pneumatic tires. This compact mobile unit produces a large tonnage with easy mobility. It is manufactured in three sizes; 50, 100, 150 tons per hour, com-

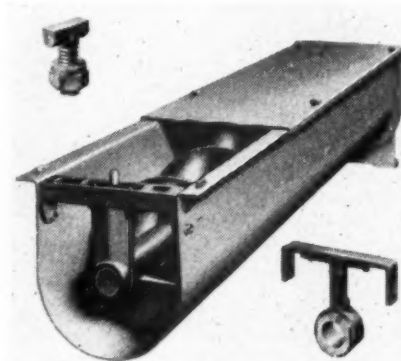


Straight line production portable crushing plant

plete with jaw crusher, roll crusher, feeder, revolving elevator, vibrating screen and power unit.

Screw Conveyor Cover

THE JEFFREY MANUFACTURING Co., Columbus, Ohio, has designed a new cover and T-head bolt for spiral con-

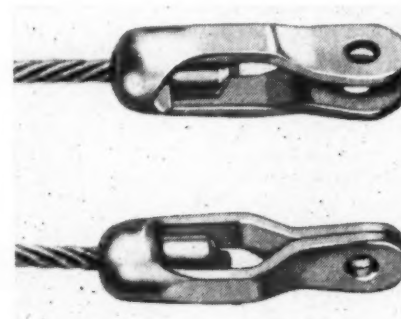


Showing a standard spiral conveyor with a special hanger and a cut-away section

veyors. The cover is flanged, providing a smooth rounded edge and adding stiffness which is said to permit the use of fewer bolts. Slotted holes in the cover permit it to pass over the T-head bolts without removing them. By simply giving a quarter turn to these spring-mounted T-head bolts, the cover is locked securely.

Cable Terminals

MACWHYTE Co., Kenosha, Wis., has announced that it is now making "Sockettype Cable Terminals," formerly manufactured by Paulsen & Nar-

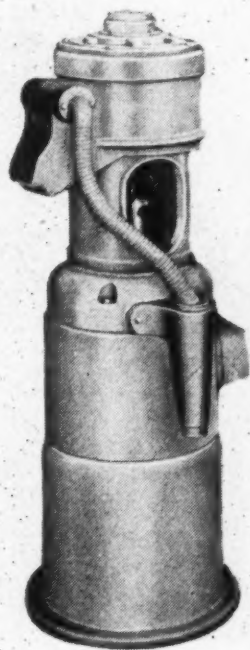


Cable terminal which permits cable to swivel freely when load-free, eliminating kinking

don, Inc., Los Angeles, Calif. These terminals consist of an alloy steel cadmium plated eye or fork type fitting, plus a stainless steel sleeve for swaging to wire rope. They are available loose or attached to the rope in a complete cable assembly to specification length.

High Speed Mill

MOREHOUSE INDUSTRIES, Los Angeles, Calif., has announced its HY-R-Speed grinding mill, No. SB1400, which is said to be highly efficient for



Mill for grinding pigments in cement

dispersing pigments used in the production of colored cement, finished coat stucco, cement paint, colored cement mortar and a wide variety of similar products. These mills have been recently employed to disperse pigments throughout cement. Combined with latex, the result was a superior surfacer for ship decks and other floors which require non-slip qualities.

The mill operates at 3600 r.p.m., and performs a number of functions, including grinding, dispersing, mixing, disintegrating, homogenizing and emulsifying. It is compact with dimensions of 1½- x 5-ft., and grinding stones are 7¼ in. in diameter. The mill is driven by a 20 hp. motor, and the weight, fully assembled, is 700 lb.

Large Crawler Tractor

ALLIS - CHALMERS MANUFACTURING Co. is now in production on its HD-19 Diesel crawler tractor at its Springfield, Ill., plant. This tractor, which is claimed to be the largest and most powerful of its type, has several outstanding advantages.

A three-stage hydraulic torque converter introduced into the power train of the tractor has given increased capacity. Application of the liquid drive principle to crawler type tractors permits horsepower output of the engine to be held constantly near the maximum. Operating adjustments and

maintenance are facilitated by locating major assemblies so that the least possible effort and loss of time are involved. Positive-seal grease packed truck wheels, idlers and support rollers are serviced at the factory and thereafter require greasing attention only once every 1000 hours. Operator comfort has been incorporated in the design with provision for an easily adjusted operator's seat to afford maximum visibility front and rear. Hydraulically powered steering levers offer finger tip steering control. Adjustable brake pedals, self-energizing brakes, and convenient arrangement of other controls are additional features.

Fluid power or the torque converter drive eliminates much gear shifting. The HD-19 transmission has only two forward speeds (0 to 3.0 low gear,

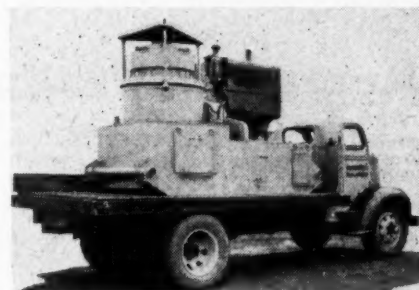


Powerful tractor has many applications in the rock products industry

0 to 7.0 high), and one reverse (0 to 5.5). An A-frame track stabilizer design eliminates twisting strains and provides rigid track alignment, and a track tread of 84 in. plus 8 ft. 10% in. of track on the ground provide good ground contact.

Portable Crushing Unit

NORDBERG MANUFACTURING Co., Milwaukee, Wis., is now in production of a self-contained portable crushing unit, the 22-in. packaged series of Symons cone crushers. This unit consists essentially of a 22-in. Symons cone crusher, motor and drive, mounted on a welded steel supporting base



Self-contained, portable crushing plant

and skid. The packaged unit can be readily transported without disassembling drive and piping or draining oil from the pressure lubrication system. It can be supplied with electric motor or with Diesel or gasoline engine drive.

This unit is said to be particularly efficient for semi- or fully-portable operations, or for stationary plant operation as a compact, self-contained, secondary reduction unit.

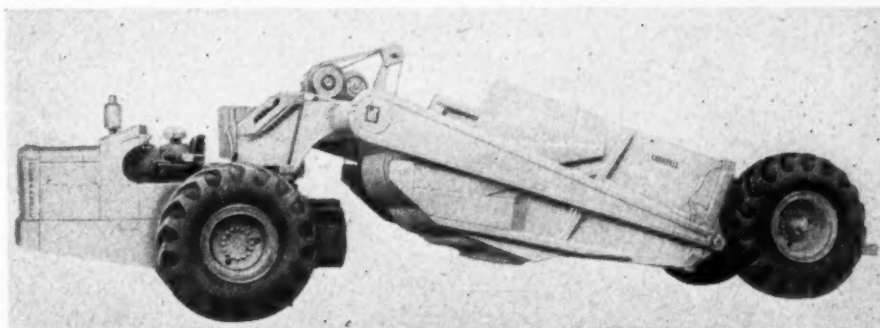
The discharged production can be drawn off on a belt conveyor or bucket elevator from any one of three sides of the unit. Capacity of the 22-in. crusher varies from 20 t.p.h. at ¾-in. setting to 60 t.p.h. at about 1½-in. setting.

When operated by 60-cycle electric power, a 25-hp., 1200 r.p.m. motor is used with push button starter station, V-rope drive and safety guard.

On the Diesel and gasoline engine units, the steel supporting base is fitted with a built-in, 85-gal. fuel oil compartment and a 60-gal. lubricating compartment. The Diesel engine has an oversize rating of 50/55-hp. at 1500 r.p.m. governed speed.

Big Capacity Earth Mover

R. G. LETOURNEAU, INC., Peoria, Ill., has brought out another model high-speed, electric-controlled 35-ton capacity unit, Model B Tournapull. It is powered by a 225-hp. Diesel engine, and is available for use with two sizes of scrapers, the E-35 Carryall, having a 35-ton truck capacity, or the 25-ton E-25 Carryall. The unit has four speeds forward, two in reverse and travels up to 15 m.p.h. Individual electric motors control Tournapull steering, Carryall bowl, apron and tailgate.



Earth-moving unit designed for big stripping jobs

New Markets

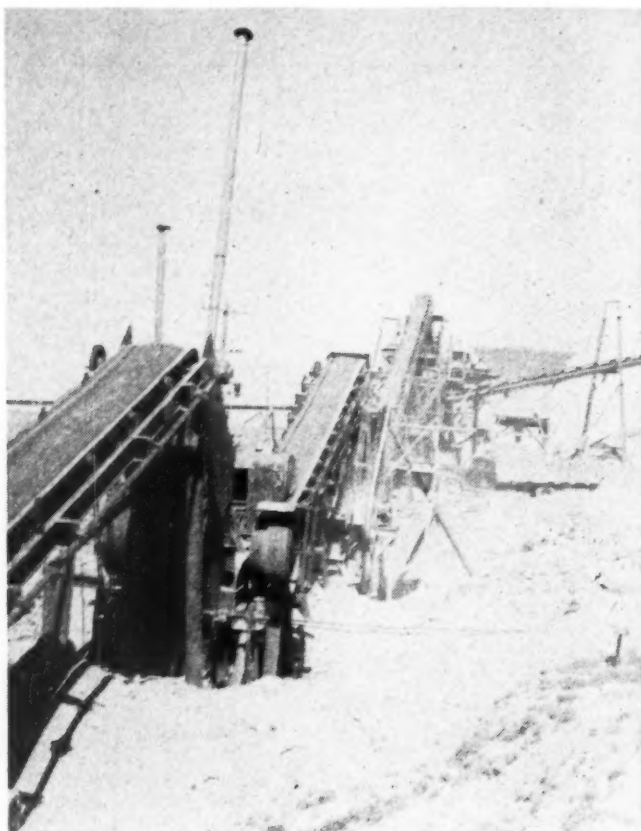
Aggregate Producer Expands Into Ready Mixed Concrete and Products Fields

F. M. Reeves and Sons, Roswell, N. Mex., converts plant facilities from war to peace-time requirements

ROSWELL, New Mexico, a city of about 25,000 population, derives its support from agriculture and cattle raising. During the last world war, the rock products industries received a large volume of business from the huge airport and training fields the government established there. In 1943 F. M. Reeves and Sons moved a sand and gravel plant from Pecos to the outskirts of Roswell. During the war years, this company enjoyed a large volume of government and other business, one single order being for 200,000 tons of hot mix. Later the runways were changed over for B-29's, and some 500,000 tons of concrete aggregate came from this operation.

The transition from war conditions to peace was accomplished without serious change of pace. Ready mixed concrete was finding a wider commercial application in the area, and just recently the company increased its transit mix truck equipment by the purchase of two additional 2-cu. yd. Rex mixers to be mounted on International trucks. Older equipment included a 3-cu. yd. Ransome mixer on White chassis and two Rex units (also on International chassis). The

Sand and gravel section of plant looking from truck hopper near primary crusher



transit mixing plant has been in operation about nine months. For batching, a 3-compartment 100-ton capacity Heltzel bin and weigh batcher, provided with Kron dial scales, is used.

Block Plant Tied in With Ready Mix

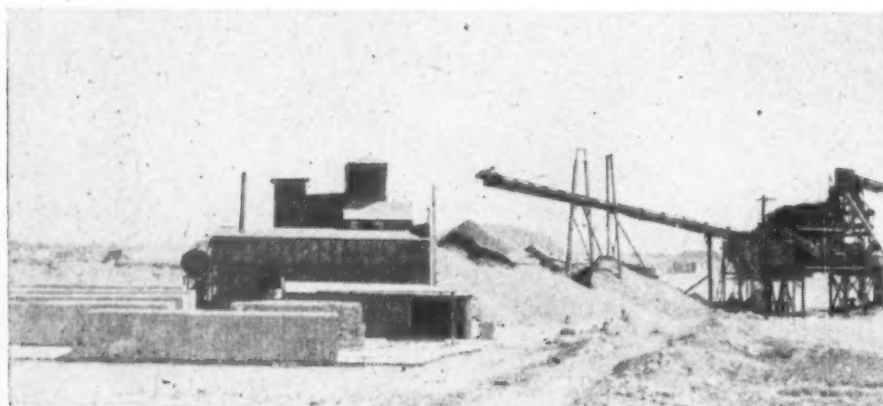
To further round out its sand and gravel business, the company installed a small concrete block plant using a Stearns stripper. The block plant is so tied in with the ready mixed concrete plant that the Stearns mixer receives its aggregate from the Heltzel batcher. Cement in cloth bags is used for both the ready mixed concrete and for the concrete masonry, mainly because the plant is 2½ miles from the railroad. Three steam kilns, each 8- x 60-ft., are operated with

two Barrett lift trucks for handling the blocks in and about the plant. Blocks of 5-in. thickness are about the only kind made as they are very popular in this section. Sizes are as follows: 5- x 8- x 12-in., 5- x 4- x 12-in., 5- x 8- x 10-in., and 5- x 8- x 6-in. The plant has a capacity of 400 blocks per hour. Tests were made recently which showed the product to have a compression strength of 1750 p.s.i. There were formerly about 10 block plants in Roswell, but when this company installed steam kilns the plant was operated throughout the winter months and with greater econ-

F. M. Trent, manager



Concrete block plant with ready mixed concrete plant to the rear



only so that many of the smaller block plants have gone out of business. The company has been operating on a 7-day a week basis. The sand and gravel plant is operated until stockpiles are full, and then the slack is taken up by all turning to and operating the concrete masonry plant. Thus by a well rounded production schedule no lost time is experienced and all work is at top efficiency.

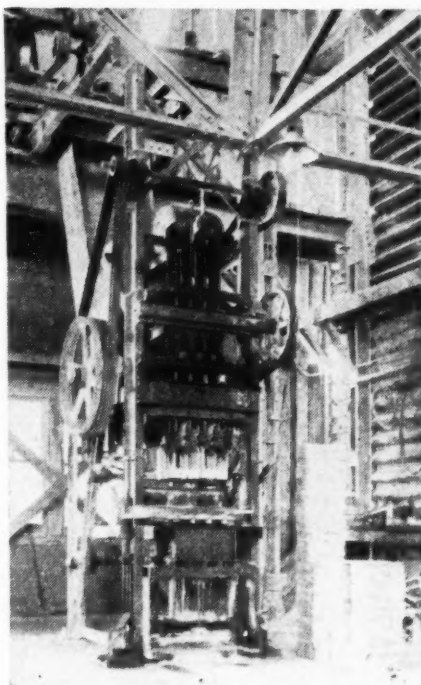
Sand and Gravel Plant

The sand and gravel plant is a neat and well laid out operation which employs the use of butane gas and Diesel engine driving units. It was company designed and built. All engines using butane for the power source are connected to one large butane tank so that servicing is kept to a minimum.

Compared to most operations, the deposit being mined adjacent to the plant is rather shallow, and work therefore has been carried on over a considerable area. The gravel is small in size and varies in depths from 6 to 16 ft. For loading and stripping a No. 105, 1 1/4-cu. yd. Northwest dragline loads to International trucks equipped with 4 1/2 cu. yd. (rated capacity but actually loaded to 6 yd.) belly dumps.

Trucks dump to a flat, 6-in. spaced rail type grizzly mounted over the truck hopper. The material from this hopper is fed to a 30-in. inclined belt conveyor by a reciprocating pan feeder. The belt delivers material to a 9- x 36-in. Cedarapids jaw crusher driven by an Allis-Chalmers L-90 butane gas engine. Jaw crusher throughs go to a second inclined 30-in. belt conveyor that serves a double-deck 4- x 8-ft. Telsmith screen that acts as a scalper ahead of the 24- by 40-in. J. E. Inghram secondary crushing rolls. Product of the rolls, which is driven by a Caterpillar D 1300 Diesel, go to a 24-in. inclined belt conveyor serving the washing plant where a 4- x 12-ft. triple-deck Simplicity prepares the final products. Concrete sand is the only sand produced, and it is prepared with two sand drags. The sand drags are driven by an International U-2 butane gas engine; the Simplicity screen by a U-21 International butane unit, and the rest of the plant is operated with an International PA-100 butane gas engine.

Water is used at the rate of about



Stripper type block machine is used

700 gal. per minute, and is supplied by two Peerless deep well pumps. One of the pumps is electrically driven but the second one is driven by a Caterpillar D 4400 Diesel. The plant has a capacity of 150 tons per hour of washed gravel and sand.

The plant is owned by F. M. Reeves and his sons, Henry Reeves and Felix Reeves. M. C. Trent is manager at Roswell.

Asphalt Adhesive Qualities

ADHESION FAILURES between binder and aggregate of tar or asphalt macadam surfaced highways have been noted over a period of time, and in an attempt to arrive at the cause for this failure, extensive tests have been carried out here and in foreign countries. There appears to be a displacement of the binder by rain-water, although other factors such as traffic abrasion and heat apparently influence the process as well.

Many theories have been put forward by highway engineers and others to explain binder displacement or loss of adhesive qualities. Two widely accepted views are that the binder, being of an acidic character, will adhere more strongly to geologically basic aggregates than to acidic stones; and that adhesion is dependent upon the surface texture or roughness of the aggregate.

All of the various factors entering into adhesion make the property difficult of measurement or definition, but as a basis for further work, the following definition was evolved: "Adhesion of a liquid to a solid is the combined effect of the actions of surface tension, adsorption, and other properties of the solid and liquid surfaces, resulting in the liquid spreading

over, and resisting removal from, the surface of the solid."

Adhesion is a composite property which is not capable of measurement on an absolute scale, and to make a quantitative measurement of adhesion, two methods are available. Either adhesion can be measured by its results, such as the rate of spread of a liquid over a solid; or an attempt can be made to measure the effect of the more dominant property as an index of adhesion of the liquid to the solid (i.e.: surface tension, etc.).

In a paper by J. F. Douglas, England, abstracted by G. A. Rahn, Engineer of Materials and Construction, methods of research and conclusions of ten authorities on the subject are listed, together with the author's analysis of results. In the summary, four factors are felt to have a definite connection with adhesion properties, i.e.: mineral composition, surface texture, surface dryness and surface tension. One factor that is still to be investigated is porosity, while it is felt that the chemical analysis of the aggregate (acidic binder-basic stone theory) apparently has no chemical basis. This paper appears under the auspices of the National Crushed Stone Association as Useful Information bulletin No. 4-24.

Effect of Asphalt On Abrasion Loss

RESULTS of a test conducted by the National Crushed Stone Association to determine the effect of a thin asphalt coating on the Los Angeles abrasion loss of a crushed limestone sample have been obtained. Four samples were used, all containing stone of the same gradation.

Sample No. 1 contained no asphaltic coating. Samples Nos. 2 and 3 were mixed originally with 2 per cent of Sealdrok waterproofing compound (probably fuel oil containing some asphalt), the stone first having been heated to a temperature of 300 deg. F. and cooled to 150 deg. F. at the time of mixing. The amount of Sealdrok compound on the stone was 1.6 and 1.4 respectively. The specimens were then exposed to air for a period of ten days and oven dried at 220 deg. F. for one day. Sample No. 4 was mixed with Sealdrok waterproofing compound in the same way as samples 2 and 3 and was then further mixed with 1 per cent of RC-2 cutback asphalt.

The percentage of loss of the four samples tested was as follows:

Sample No.	Per Cent		Per Cent Loss Los Angeles Rattler Test
	Sealdrok	Cutback Asphalt	
1	0	0	31.6
2	1.6	0	18.9
3	1.4	0	18.9
4	1.5	1.0	14.2

Although tests indicate that a coating of Sealdrok and asphalt should decrease abrasion loss under traffic, the fact has not yet been demonstrated.



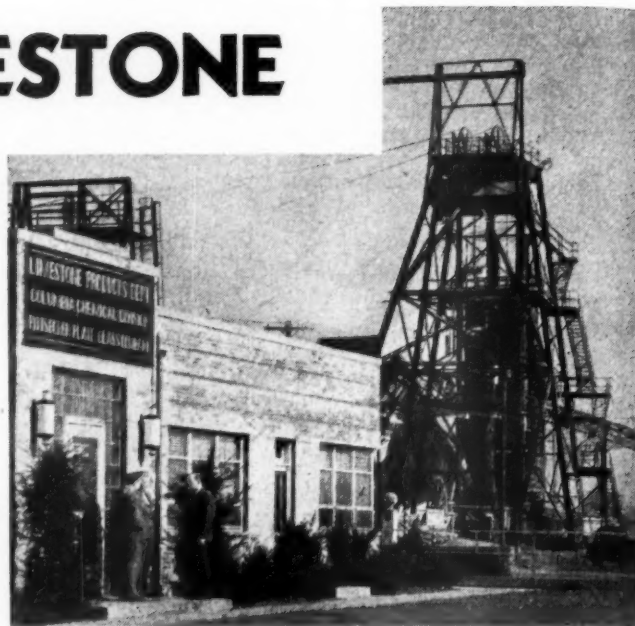
Typical mixer truck equipment

CRUSHING LIMESTONE

Half Mile Underground

Pittsburgh Plate Glass Co., Columbia Chemical Division, opens world's deepest limestone mine to supply high calcium stone to Barberton, Ohio, alkali plant. By-products are commercial stone and agstone

By BROR NORDBERG



General office in foreground and mine headframe, to the right

WHILE descending almost one-half mile through a vertical shaft to view operations within the world's deepest limestone mine, it was hard to conceive that we were to see a product valued so low as limestone being exploited at that depth. Our previous experience with mining in our editorial travels had been largely limited to hillside mines and drift mines, and we had not anticipated ever traversing, in the space of five short minutes, through hundreds of millions of years in geologic time as represented by glacial drift, sandstone, layer upon layer of shales to reach a far down stratum of lime-

stone valuable enough to be mined.

Neither were we accustomed to associate limestone mining with oil-bearing strata, methane gas and 83 deg. F. temperatures which require ventilation for cooling as well as purification of the air. The ordinary limestone mine has a temperature of 58 deg. F. or 60 deg. F. but here we have a mine far below the water table where temperature rises a degree for every 50 to 100 ft. increase in depth, bringing home the realization that the center of the earth actually must be molten.

The mine is the property of the Pittsburgh Plate Glass Co., Columbia

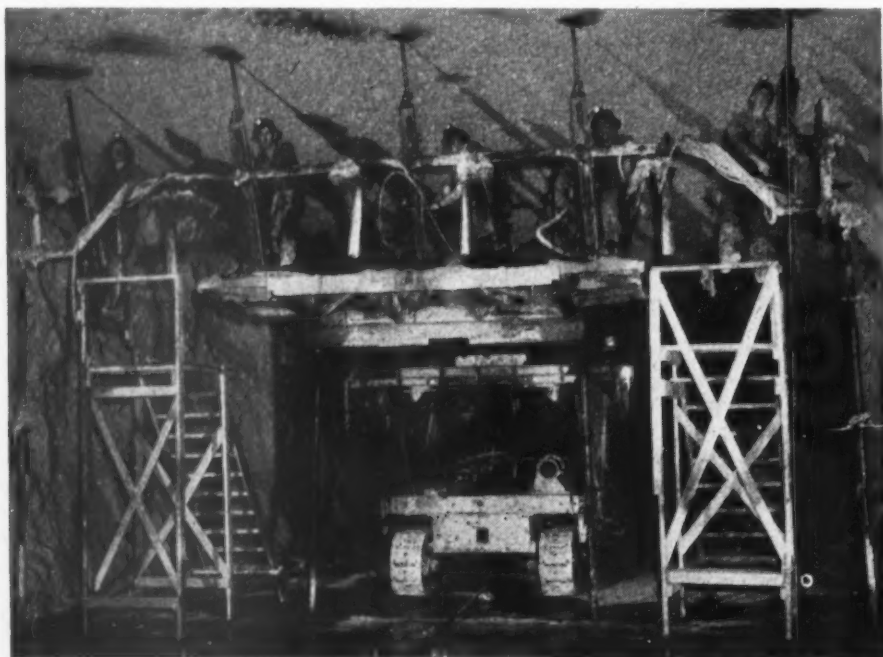
Chemical Division, and its location is two miles from the company's tremendous alkali works at Barberton, five miles southwest of Akron, Ohio. High calcium limestone is valued raw material in the manufacture of soda ash, caustic soda and other chemicals manufactured at Barberton. The chemical plant is located favorably with respect to principal raw materials, including salt which, incidentally, occurs 500 ft. below the limestone bed being mined, but has in the past depended entirely for limestone on sources far removed.

A local source of limestone was desired but the Akron area is devoid of outcropping high calcium limestone. The decision to mine at great depth was decided upon as economically sound in order to guarantee a steady source of supply of limestone and because expensive freight charges would be eliminated, and the necessity for maintaining tremendous stockpiles of limestone during the winter months when the Great Lakes are ice-locked would be minimized.

Existence of the deposit being worked, identified by geologists as Columbus limestone (Devonian Age), was known for many years. Chemical analyses of the sludge from churn drill holes made years ago proved that the limestone was sufficiently pure to warrant diamond drilling exploration. Subsequently, cores were logged to prove the stone had excellent physical and chemical qualities, which were the basis for development of the mine and accompanying crushed stone plant of 300 t.p.h. capacity.

Stone-Requirements

The stone is non-porous, massive, medium gray in color and has scattered crystals of calcite visible in a

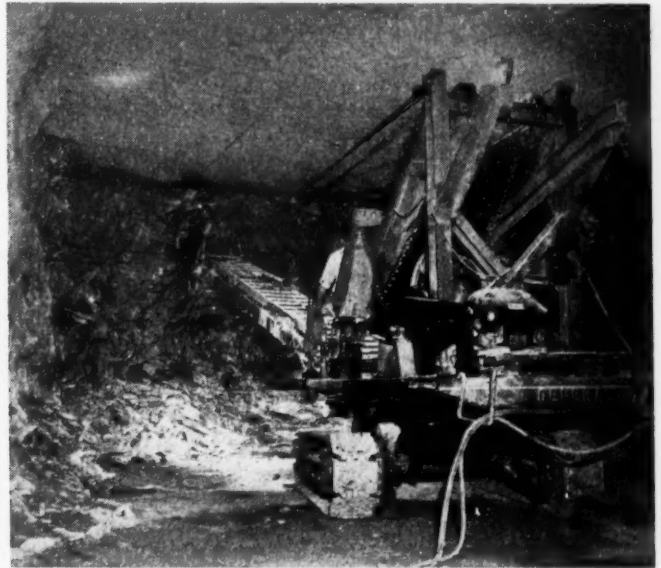


Drifter drilling operation with the crew working from a Jumbo drill platform

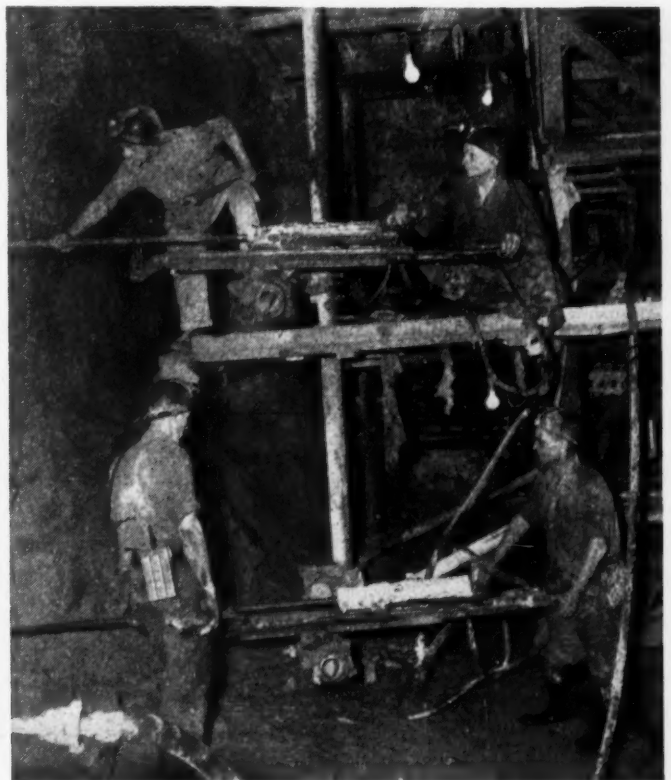
MINING



To the left, mine headframe, crushing and screening plant in the center, and radial storage plant for commercial stone, to the right



Two types of scaling rigs, the long-armed rig, to the right, reaching up to 46 ft.



Two-level drilling, to the left, and three-level drilling, to the right

micro-crystalline groundmass. Fossils occur frequently and the stone has all the physical characteristics required for high grade commercial aggregates.

Only the top 46 ft. of a 345 ft. thickness of stone is to be mined because the lower part of the stratum becomes dolomitic as it approaches an underlying 200 ft. of gypsum (anhydrite) and gypsiferous shale. A minimum of 92 per cent CaCO_3 is sought for chemical purposes. An average analysis of the mined product is 92 per cent CaCO_3 , 3 per cent MgCO_3 , 4 per cent SiO_2 , 0.8 per cent R_2O_3 , and ignition loss of 0.2 per cent. Quartz is present as subangular to semi-rounded grains and chert masses, and its occurrence has an important bearing on the drilling pattern and development methods employed in the mine.

Columbus limestone occurs 2200 ft. below the earth's surface. It is overlain by 18 ft. of glacial sand and gravel, 100 ft. of water-bearing sandstone and 2080 ft. of various shale formations with which sandstone is interbedded. Contact of the shale and limestone is abrupt, pronounced and flat lying. This relation and the uniformity in physical characteristics of the rock formation are fortunate occurrences. The stone has several separating layers occurring at definite horizons and has distinct partings which are horizontal planes of weakness favorable for roofs and floors in room-and-pillar mining. Partings divide the stone into seams ranging from 7 in.



Pattern for drilling ceiling shot fired by 14 time delays

to 6 ft. thick. Almost uniformity of these physical characteristics which has prevailed throughout the approximately 70 acres already mined out has enabled the adoption of uniform drilling patterns and standardized mining methods to be discussed later.

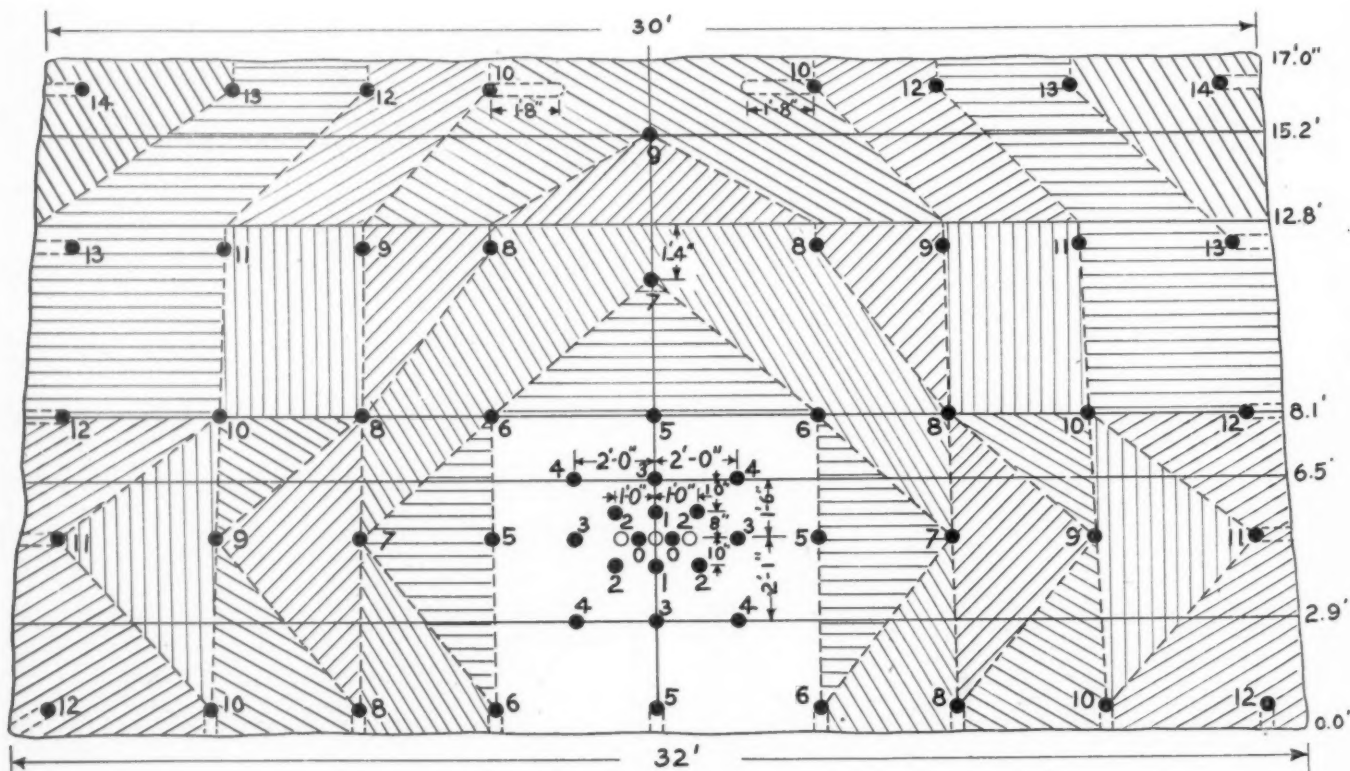
Two sizes of limestone, 1- to 4-in., and 4- to 6 $\frac{1}{4}$ -in. size, are specified for chemical use. The stone is calcined in vertical kilns and is then hydrated prior to further processing in the manufacture of alkali chemicals. Of the total tonnage, 300 t.p.h., some 200 t.p.h. fills in that size range and the balance is processed into agricultural

limestone and commercial aggregates.

The project consists of the mine, which is reached by either of two shafts, 2323 and 2258 ft. deep, underground primary crushing and screening plant, and skip bucket delivery through one of the shafts to an above-ground crushing and screening plant. The shafts are 16- by 7-ft., one of which is a service shaft and the other a production shaft for elevating stone. They are 550 ft. apart and their cross-sectional area was determined according to requirements for ventilation. Ventilating air is forced down the service shaft, circulated throughout the working areas in the mine and exhausts through the production shaft.

Sinking of the mine shafts was started in 1941, and some 400 days were required to reach the desired levels. The 500-ft. connection between the two shafts was begun in July, 1942, and completed in January, 1943. Manpower and equipment shortages necessitated by the war prevented attainment of the production goal until late in 1944 and, in some respects, notably drilling and blasting practices, the mining procedure may still be considered as under constant development.

Employing a two entry room-and-pillar method of development, the mine now consists of a series of rectangular rooms, 32 ft. wide, 600 ft. in length and with a ceiling of 28 ft. which will be raised to 46 ft. Some 50 per cent of the mined area is left standing in pillars. Stone is delivered



Standardized drilling pattern for headings. A shot consists of 14 time delays, as indicated

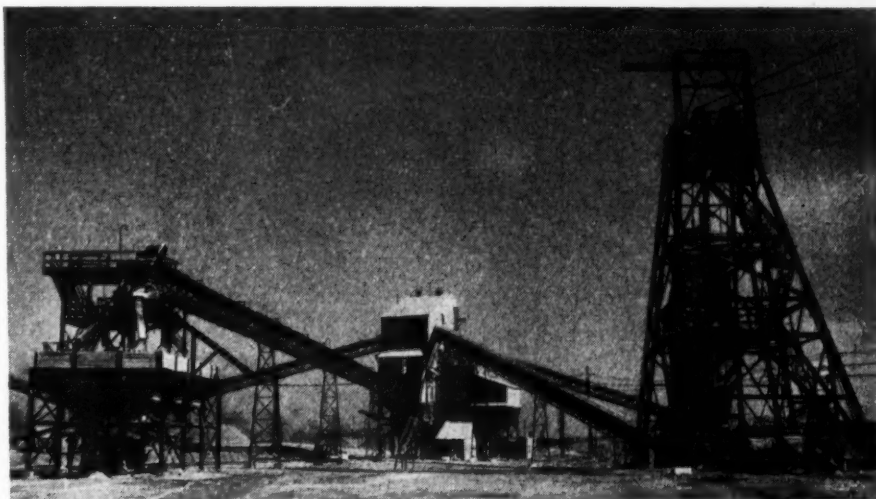
to a primary crusher near the production shaft, from various rooms under simultaneous development.

Specific drilling methods and operating procedure are extremely interesting and there are many points of more general interest to the mine. The complete mechanization and the use of large capacity power equipment of types employed in commercial quarrying are unique and presented one of the greatest problems in connection with starting the mine. All heavy equipment, including tractors, electric shovels, dump trucks and transformers, had to be disassembled, lowered and reassembled either by the manufacturers' mechanics or company men. Much of the equipment had to be specially designed so that it could be lowered through the shaft and a large proportion, notably drilling and scaling rigs, were designed by company engineers. This being a pioneering venture in limestone mining, special conditions were encountered for which no standard equipment was available.

Diesel equipment was provided wherever great mobility is required because low CO in the exhaust gases were required of internal combustion engines, and electric power is standard for all other movable equipment such as the excavating shovels and drilling rigs. Compressed air for drilling and running water are piped down from overhead, and a transformer station for electrical power voltage needs was set up down in the mine. Cool water drinking fountains, lunch-rooms and toilet facilities are available underground and there is a complete machine shop for normal repair and maintenance.

Drilling and Blasting

The room-and-pillar method of mining with the development of rooms 32 ft. wide, 17 ft. high and 600 ft. long were standard practice in the beginning. Long rooms with frequent breakthroughs are preferred because they save on development work. Some of the rooms have been raised to 28 ft. by stoping an additional 11 ft. from the ceiling and eventually the ceiling will be established at 46 ft. throughout. Greatest economies in drilling and blasting will be accomplished as stoping progresses, with the greater tonnage that will then come available per unit of time worked. The rock being of uniform occurrence and flat bedding, a standard pattern of drilling and blasting has been adopted. Drifters, stope drills and wagon drills—all pneumatic—are employed, and all drilling is done wet with hollow drill steel and detachable bits. Drilling equipment includes Cleveland wagon drills and drilling rigs, Ingersoll-Rand, Sullivan and Gardner-Denver drills for stoping and drilling. Experiments with various pneumatic drills, explosives and drilling patterns were conducted over a long period of



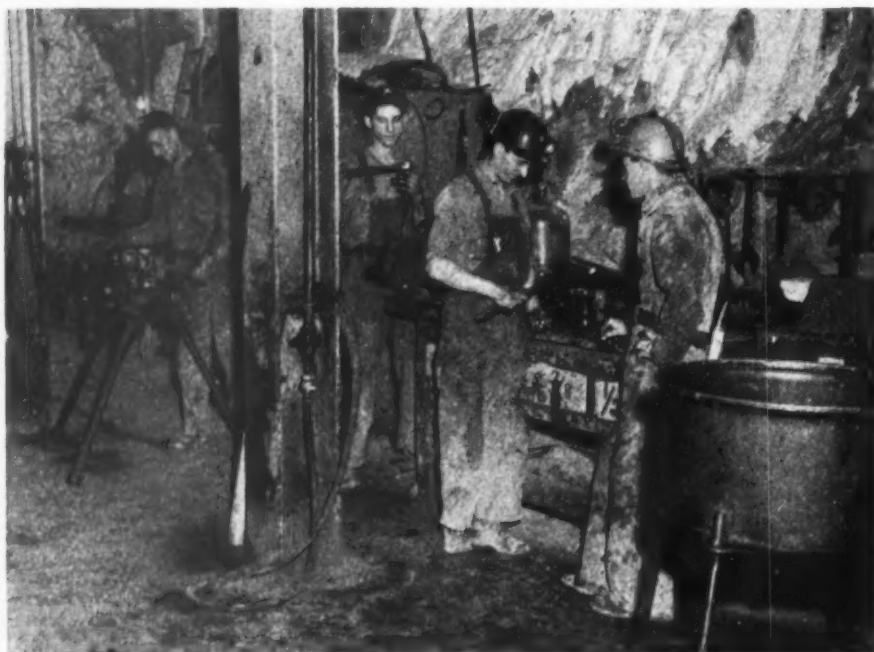
Close-up of headframe, crushing and screening plant, center, and truck loading bins, to the left



Checking a "shot." Note the excellent breakage



Horizontal conveyor carries stone to truck bins in background. Truck, foreground, serves to stockpile chemical stone out of bins



A complete shop is maintained in the mine for all repairs and maintenance

experience with the object to bring down stone as coarse as it can be handled and with a minimum of fine sizes. Standard drill holes are 2½ in. for wagon drills and drifters; 1¾ in. for stopes.

Mining Equipment

Mining comprises the drilling, careful scaling down of loose rock, loading, and shooting by standard electric time delays from a 220-volt line. Some of the company-built rigs for drilling, scaling and loading of drill holes are ingenious and are shown herewith. For drilling drift holes, there are two "jumbo" drilling units. One mounts six drifters on columns-and-arms for three level drilling and rides on cater-

pillars; the other carries four drifters for two levels on adjustable booms mounted on a truck chassis. Both units are powered by 440-volt electric motors. A third jumbo rig, on cats, carries five drifters for drilling ceiling stopes. The drifters for stopes are equally-spaced on a bar so that the entire width of the room (32 ft.) can be drilled at once. Mounted on caterpillars, this rig can be readily converted to a four-machine rig for drilling room faces.

Another adaptation of this unit is to drill 42-ft. holes using coupled drill steel to stope as high as 46 ft. above the mine floor in one operation. A double-length feed is employed on this operation to reduce drill change time,

by mounting an entire automatic feed drifter onto the automatic feed of a second drill machine, thus doubling the total drill travel. Regular wagon drills on standard mountings drill the "openings" holes in the headings.

Two special rigs have been built for scaling down loose rock. One has a boom and cage, mounted on an old caterpillar shovel base, that telescopes to a height of 46 ft., which is the ultimate ceiling of the mine. The other is a Cletrac Diesel-powered bucket loader to which a cage is attached for the scaler. This machine serves utility purposes as well, being used to cast scaled pieces of stone aside to make way for other excavating machinery or for direct loading of stone into trucks for delivery to the underground crushing plant. It also can be fitted with a bulldozer blade for trimming piles of stone or for road maintenance. A Ford utility truck with Diesel engine drive is used for loading ceiling shots and drift holes high up on the headings.

Loading Equipment

Loading is done by two Marion 362 electric shovels, with 1½-cu. yd. buckets, into Koehring Diesel end-dump Dumptrucks, of which there are eight in the mine, hauling seven tons of stone each to the crusher; two slushers, and a Joy loader just placed into service. The shovels are caterpillar-mounted, full revolving machines of standard design, with 14 ft. 6 in. booms and 10 ft. 6 in. dipper sticks, for operation in low ceiling mines. The tail of the platform on each was cut to a 10 ft. 6 in. radius and counterweights were adjusted accordingly. Driven by a 75-hp. electric motor, fed from a 2300 a.c. volt line, grounding is carried to the surface of the mine.

The slushers are operated principally in the double entries which are 24 ft. wide and 17 ft. high, where progress is made by advancing 9- by 24-ft. headings followed by dropping an 8- by 24-ft. bench. On these loading units, a 3-drum electric slusher hoist pulls a 5-cu. ft. scraper from the face back to the unit and up an elevated ramp to drop the stone into trucks. They are caterpillar-mounted for easy maneuverability in backing away from the blasting and return to the muck pile. A Caterpillar Diesel tractor handles road maintenance and assists in cleanup.

Drilling Pattern

A 63-hole blasting round pattern, as shown herewith, has become standard in carrying a 17- by 32-ft. heading forward. At first, the conventional V-cut method common to most limestone mines was employed but was discarded in favor of the present method which yields a better advance and less throw of the stone. The pattern was developed to produce maximum breakage and take advantage of the natural partings, while avoiding



Electric shovel loading Diesel dump truck in mine

any drilling in the hard layers which are hard on drill bits. Holes designated 0-4 on the pattern and some of the No. 5 holes are drilled straight forward into the face to depths of 11 ft. to 13 ft. with wagon drills (21 holes) and the balance with drifters.

Loading is with 40 per cent semi-gelatin dynamite with some plugging, and the entire round is fired at the same time with 14 delays of electric blasting caps to bring down from 500 to 800 tons of stone. The three holes alternated with the two designated as 0 are not loaded and merely serve to facilitate opening a wedge. Holes designated 0 are fired instantaneously, Nos. 1 are the first time delays, etc., until the entire face is shot. A lantern slide of the drilling pattern was prepared and the pattern has on occasion been projected on the face with a standard slide projector to acquaint the drillers with the exact location of each hole which was marked on the face with a daub of paint.

As each round is drilled ahead, three short vertical holes are drilled into the roof to bleed out a small amount of Methane gas which being under great pressure, is thought to have been responsible for some previous roof falls. The gas apparently accumulates at high pressures in the partings and forces thin slabs of roof stone down.

Stopes are also drilled to a standard pattern. Holes are spaced six feet apart across the ceiling of a room and rows are five feet apart for the entire 600-ft. length of the room. Seven rows are shot simultaneously using 14 electric cap time delays hooked up as shown in the diagram on page 74. Stope holes are drilled at 70 deg. to the vertical to prevent spill on men and equipment, starting at a 20 deg. angle and gradually increasing to 70 deg. An average stope shot to the 28-ft. level brings down approximately 875 tons of stone. All the stope holes for a 600-ft. room are drilled before any stone is blasted in order to have the way cleared for drilling equipment, and practice is to blast on



Loading blast holes in the mine ceiling

alternate shifts. The mine is operated on two shifts, one from 7 a.m. until 3 p.m. and the other from 3:30 p.m. until 11:30 p.m., the blasting crew coming on duty at 4 p.m. and blasting between 11:30 p.m. and midnight. The blasting crew is a highly trained group of men, expert in the handling of explosives.

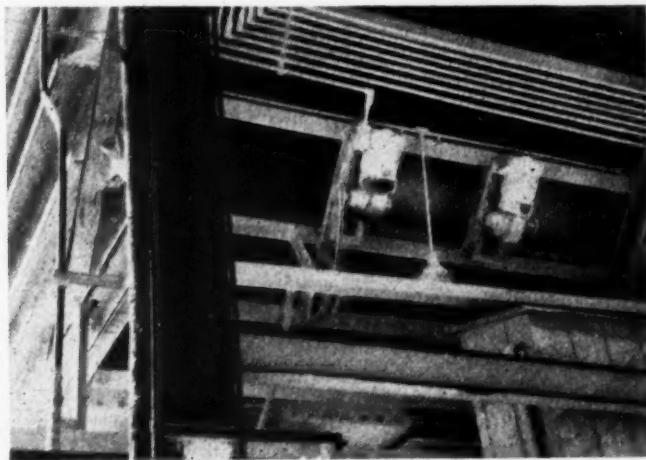
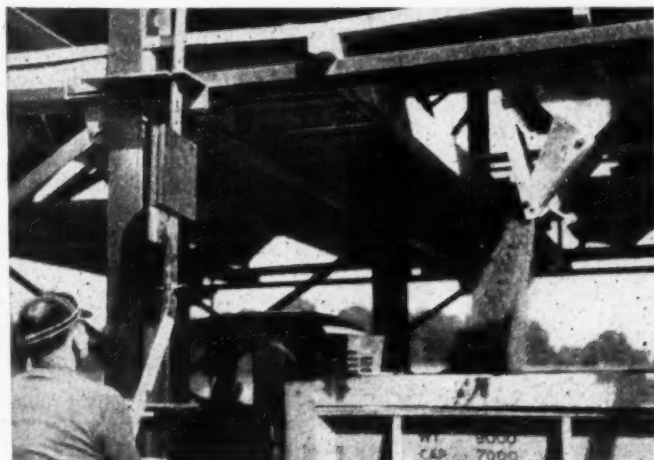
General Mine Features

Except for the working area near the service shaft entrance, where the machine repair shop, transformer station and mess hall are located, the mine is unlighted except for the electric cap lamps carried by each miner. However, green and red "stop and go" signals are provided at main entry intersections for safe operation of trucks and an overhead "wait" signal actuated by cutting a beam of light as the trucks pass prohibits entry of a truck into the corridor to the crushing plant until the preceding truck has returned to the main entry.

Crushing and Screening in Mine

Crushing and screening down in the mine is geared to the production of minus 6¾-in. stone. The plant consists of a 48- x 60-in. Allis-Chalmers jaw crusher, a 5- x 12-ft. Allis-Chalmers low-head vibrating screen, inclined 42-in. belt conveyors and a 400 ton storage pocket from which skip buckets are filled for delivery up the production shaft to the overhead plant. Several hundred thousand tons of limestone were excavated to accommodate the plant, including the blasting out of stone galleries for the installation of belt conveyors.

Stone is dumped from trucks into a conventional steep-sided hopper feeding into the crusher, which is a sectionalized steel machine, tongue and groove joints, flood-oil lubricated and set to crush to about 6½-in. A Ross chain feeder regulates the flow to the crusher. An inclined belt then transfers to a second belt delivering



Left: Counter-weighted bin gate is easy to operate. Right: Remote-controlled, motor-operated bin gates for loading out chemical stone



Ventilating fan on right; center foreground is hot air heater for winter operation

to the vibrating screen which carries hexagonal perforated plate. Oversize is conveyed back into the crusher hopper and all throughs drop into the storage pocket. The mine is dry and the only water encountered is that applied to the stone after a blast to lay the dust.

A measuring pocket from the storage bin to the skips, actuated by 14-in. air cylinders, was designed for quick loading and minimum spillage. Opening a guillotine-type upper gate in the chute allows the chute, or pocket, to fill by gravity, and manual controlled opening of the lower gate measures 250 cu. ft. of stone out into the skip. Stone is elevated in balanced skips on two minute cycles.

Above Ground Mine Facilities

High temperatures within the mine and the exhausts from eleven Diesel units underground require that a vast amount of ventilating air be circulated throughout the working areas. Ventilation air forced down the service shaft by a Sirocco fan at the rate of 80,000 c.f.m. (2½-in. water pressure) reduces the temperature in

working areas to 70 deg. F. and the concentration of fumes to insignificance. Flow through is controlled by closing and opening various combinations of entry shutoffs, and exhaust is through the production shaft. Slight pockets of methane, encountered at the 2000-ft. level, are insignificant and the release of pockets of gas into the atmosphere together with the adoption of the improved blasting methods described have obviated the necessity for roof support in the mine other than the pillars left standing. Booster fans are used in some of the headings to increase the velocity of the air for more comfortable working conditions. During extremely cold weather, ventilating air is heated through a Dravo hot air heater alongside the ventilating fan above, before being forced down into the mine in order to prevent ice accumulation in the service elevator shaft.

Above Ground Mine Equipment

Compressed air for drilling is developed by an Ingersoll-Rand air compressor of 2000 c.f.m. capacity and two Bury compressors rated at

850 c.f.m. each. Line loss down into the mine is practically nil and the air is delivered to the pneumatic drills at 90 p.s.i.

All underground maintenance work except large machining jobs is handled by carpenters, mechanics, boiler-makers and pipe fitters in the underground shops and out in the mine but detachable bits and drill steel are sent to the surface blacksmith shop for hot-milling, forging and heat-treating.

Production Shaft

The main hoist is probably the first application of automatic speed-acceleration control to deep shaft hoisting. The principle is one of a modified Ward Leonard Control in which the speed and rate of acceleration are automatically controlled by a group of small pilot generators. This auxiliary motor generator comprises six machines coupled to a common bed-plate which, with a master controller, switchboard and a main motor generator, comprise a complete unit. D. C. drive is used because it has better characteristics for automatic control.

Skip buckets are 250 cu. ft. capacity weighing six tons, riding on shaft guides of 6- x 10-in yellow pine. They measure 16 ft. 4 in. overall height, have 8-in. dump wheels with Timken bearings and 12-ft. diameter head sheaves. The headframe is a 4-post steel structure 76 ft. high within which a 100 ton stone bin was built. The cycle permits 30 trips per hour from the mine and the hoist cable is 1¼ in. Lang Lay rope 2935 ft. in length. Hoisting is done by an Allis-Chalmers balanced single Bi-Cylinder conical drum, with 10 ft. small diameter and 15 ft. 10 in. large diameter. The hoist is driven by a 1250-hp. D. C. motor, has an oil-operated brake and Lilly safety controller. All stone hoisting is automatic, requiring only the skip loader's pull-switch to start the cycle.

Service Shaft

Service shaft equipment is designed for a two ton load and is held in balance by a 7700 lb. counterweight. The hoist is a 5-ft. diameter by 36-in. face, double-drum, geared Nordberg electric hoist driven by a 300-hp., 2300 volt D. C. motor. It has similar safety controls to the production hoist. Ventilation air enters the shaft 16 ft. below the collar through an 8- x 8-ft. concrete duct and the locker rooms overhead are air-locked from the shaft. The elevator in this case is run by operators who are charged with the responsibility for strict adherence to safety regulations.

Electrical Power

Electrical power for operation of the mine is 13.8 kv.a, 3-phase 60-cycle energy from the company's own power plant, reduced from 13,800 volts to 2300 volts down in the mine. Addi-



Motor-operated bin gates for loading out chemical stone

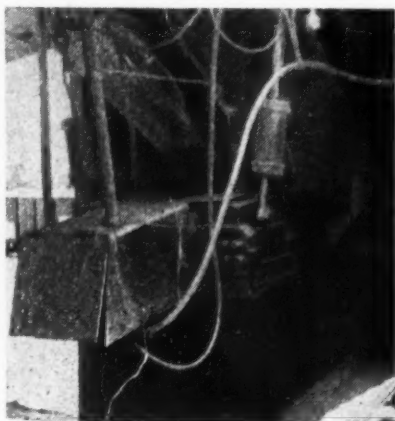


Superintendent Manderfield, right, talking over safety problems with E. E. McCamen

tional transformers step the voltage down to 440 volts for motors rated less than 50 hp. and to deliver 75 kv.a for lighting purposes. Power is transmitted underground through the service shaft by rubber feeder cables.

Strict safety regulations govern workers in the mine and frequent use of testing apparatus to check ventilation is employed. A ventilating engineer checks the condition of the mine every morning and the use of CO indicators and frequent tests of air samples is employed according to standards of practice in coal mines. Foremen check every working area before the men are allowed to enter and men are equipped with protective hats and rubber boots which are to be worn in wet areas. There is a chief mine foreman on each shift and he has under him qualified assistants in direct supervision of blasting all the time. Every miner must be checked out of the mine before the blasting crew sets off a shot. Special precautions for shaft operation prevail and each employe is required to carry a copy of the company's safety manual containing regulations for mine safety and safe practices in general. Communication and signals between the mine and above are by telephones and a call-bell system.

More than 400 days were needed to sink the vertical shafts. The shaft walls were framed with steel and ultimately lined with concrete. At first



Electric vibrating feeder to regulate flow of stone from hopper suspended in mine headframe

metal sheathing was tried but sloughing of the shale created a pressure and it was decided that concrete lining was necessary. With the exception of 100 ft. in one of the shafts through sandstone, both shafts were lined their entire depth. The upper 30 odd feet in both shafts was sunk by clamshell and interlocking steel piling. Concrete collars 130 ft. deep were poured and heavily reinforced.

Water was limited to the upper strata, at 315-ft. depth, flowing at the rate of 60 g.p.m. The flow was reduced by grouting to 15 g.p.m. and gathered into a sump 350 ft. below the collars where an automatic pump delivered it to the surface. Oil was encountered in a thin stratum of sandstone at 520 ft. and methane was tapped at 1350 ft. and 1952 ft.

Temporary headframes were built to provide storage pockets for the material brought to the surface by sinking buckets of 27 and 32 cu. ft. capacity. As the shafts gained depth, pressure fans supplied air at 5000



Diesel truck dumping load of rock to crusher hopper

c.f.m. and safety lamps were kept burning at the shaft bottoms. Drilling was done with 55 lb. jackhammers equipped with detachable bits. Each shaft was operated on four 6-hr. shifts the week around.

In sinking a shaft, the conventional V-cut was drilled at the center of the shaft and a drilling round comprised 34 holes. Powder consumption was 22.6 lb. per foot of shaft, of 40 per cent gelatin dynamite and some 60 per cent in the cut holes. Drilling was fast through the shale but the shale strata became increasingly siliceous with depth. Drilling crews were four to six men and the average advance was 5.8 ft. per day. For concreting, plank sheathing was used for forms and quick-setting ready-mixed concrete was poured (unreinforced) in 16-ft. sections behind the sheathing, rammed and vibrated.

Some of the miners brought in to



Drilling a heading

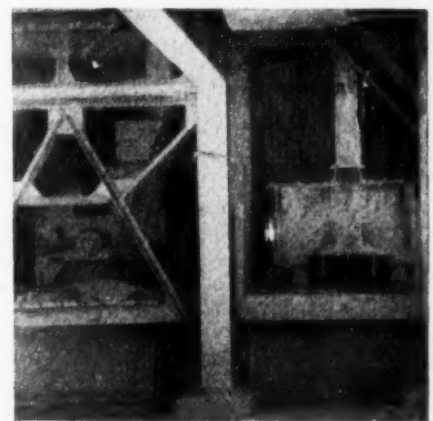
sink the shafts and develop the mine were Finns, long experienced in mining copper and iron ore in Michigan's deep mines; others had mined copper in Tennessee. A number of these men have stayed on. The mine working force totals 170 men.

Screening Plant Above Ground

All limestone, of kiln size and smaller (minus 7 in.) is elevated out of the mine in the balanced skip buckets, which trip into the 100 ton storage compartment built into the headframe from which it is put through a screening plant to separate the kiln stone sizes into bins for delivery to the chemical plant and to screen a variety of commercial products from the minus 1-in. stone. Approximately one-third the mine tonnage is minus 1-in. and approximately half of that fraction is merchandised as agricultural limestone. There are no available outcrops of agricultural grade limestone within many miles of the mine so the demand for the local product is heavy.

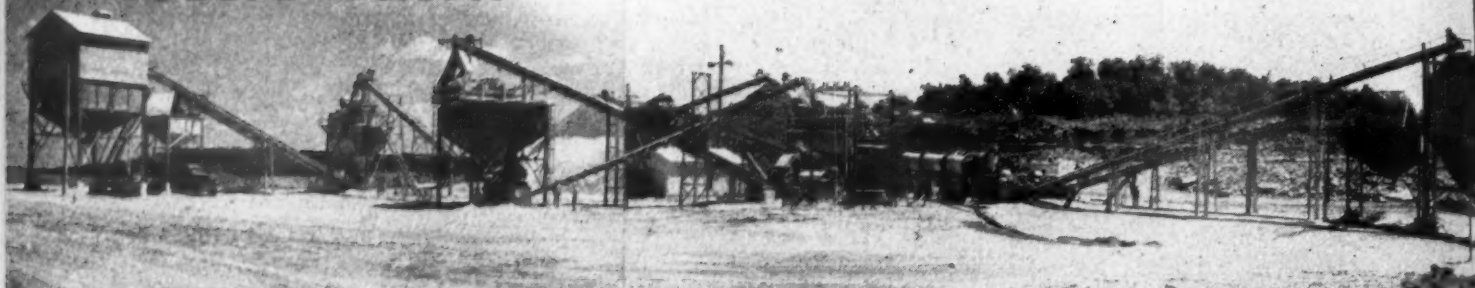
The plant comprises four principal

(Continued on page 106)



Two hammermills for the production of agricultural limestone which also serve as reduction crushers

Stone Sand



Showing production lines No. 3, 4, and 5 with 150-ton sand bin, to the extreme left, followed by minus 100-mesh waste bin, air separator, screens with hammer mill below, sizing screens with two more hammer mills below, rotary scrubbers, and storage bins to the extreme right for finished aggregates

Producing Aggregates for Ft. Gibson Dam

**M. O. Weaver, Inc., Des Moines, Iowa,
has contract for all aggregates. Use air
separator to clean stone sand product**

LOCATED on the Grand (Neosho) river 12 miles northeast of Muskogee and 5 miles northeast of historic old Fort Gibson, Okla., Fort Gibson Dam is being built primarily for the purpose of flood control and hydroelectric power development in the Arkansas River Basin. It is a part of a three-reservoir system comprising the existing Pensacola, the approved Markham Ferry and the Fort Gibson dams.

The project was designed and is being constructed under the direction of the U. S. Corps of Engineers, Tulsa District, which is under the supervision of Col. C. H. Chorpeneing, district engineer. Frank M. Newell is the resident engineer in charge at the damsite. The prime contract for construction of the dam is being handled by the Al Johnson and Winston Brothers Construction Companies of Minneapolis, Minn., and Peter Kiewit Construction Co., Omaha, Nebr.

Work under the contract began May 22, 1946, and should be completed in about two more years. When completed, the reservoir with a shore-

By GEORGE C. HAWKINS*

line of approximately 250 miles will extend from the dam in a northerly direction about 39 miles. The dam will be 2850-ft. long; 2563-ft. will be concrete work; the remainder will be compacted earth fill. The top of the dam will be at an elevation of 593 or about 110 ft. above the present stream bed. The dam will contain about 500,000 cu. yd. of concrete and 300,000 cu. yd. of rolled earth fill. In preparation for the foundation some 600,000 cu. yd. of earth and about 40,000 cu. yd. of rock have been excavated. In addition to the concrete, the dam will contain approximately 4,000 tons of reinforcing steel and miscellaneous gates and equipment. During dry weather the water level of the lake will be maintained at an elevation of about 554.0 ft., thereby providing a continuous source of hydroelectric power. The power plant will be located at the east end of the spillway, and will have a possible capacity of 73,800

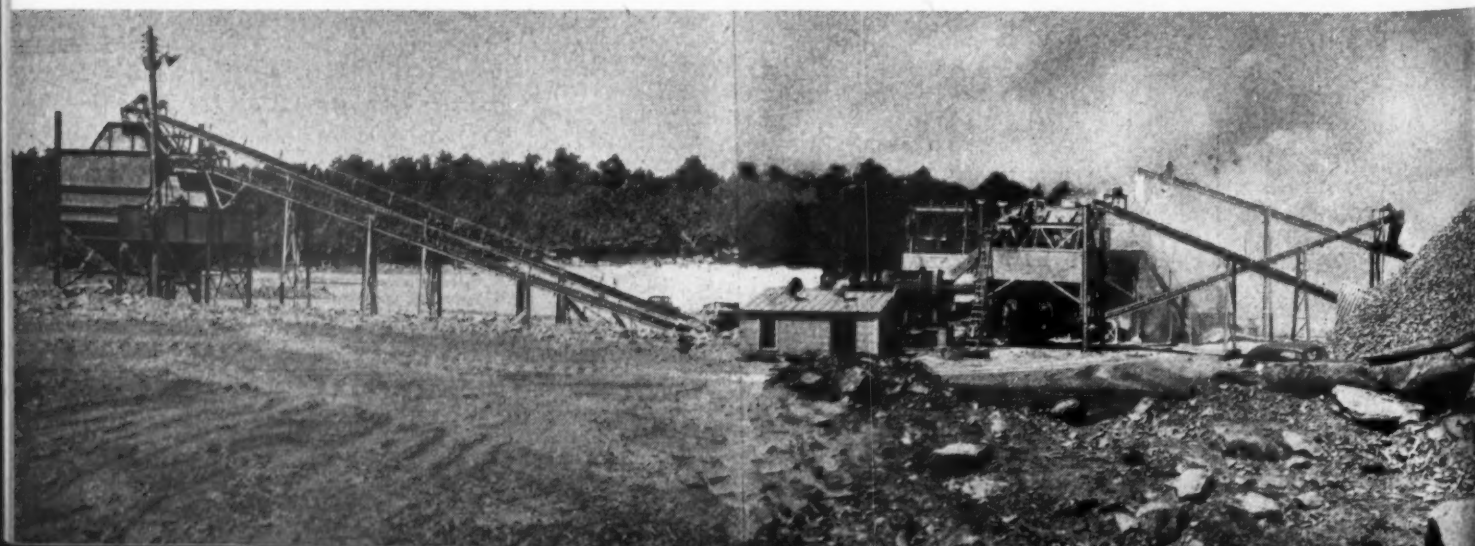
k.w. Annual output can reach about 180.7 million k.w.hr.

Aggregate and manufactured sand for the dam are being produced under a contract awarded to M. O. Weaver, Inc., of Des Moines, Iowa. The corporation, long experienced in the aggregate producing and bituminous surfacing field as well as in agricultural limestone production, is headed by E. W. Knapp of Des Moines, president, who joined the company in 1925; Paul Templeman of Fayette, Iowa, first vice-president, and Wood Weaver of Iowa Falls, elder son of the founder, as second vice-president. L. H. Peterson, general superintendent on the Fort Gibson job, joined the organization in 1933. M. O. Weaver, Inc., now operates various plants throughout the midwest, but contracts have been taken as far distant as St. Johns, Newfoundland, where several hundred thousand tons of concrete aggregate were produced for the construction of Quidi-Vidi Army base from 1941 to 1943.

Aggregate production on the Fort Gibson Dam was delayed from July,

*Consulting Engineer

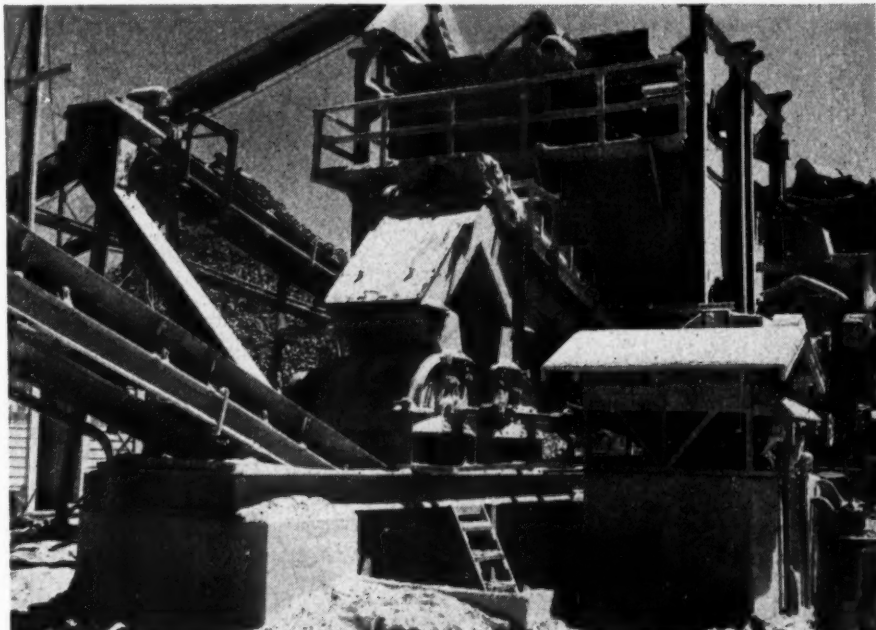
Over-all view of crushing, screening, and washing plant with primary crushing unit, to the extreme right, followed by scalping screens, roll crushers,



1946, when the original contract for the required 600,000 tons of aggregate and 250,000 tons of manufactured sand was awarded M. O. Weaver, Inc., until the final go-ahead was given on April 16, 1947, because of the inability to locate a formation of limestone in large enough quantity that was suitable in quality to satisfy the U. S. Engineers. General Superintendent L. H. Peterson and the U. S. Engineers made numerous tests on the surrounding country on the east side of the Grand river and, after much effort, a suitable quarry site was found about 4½ miles east of the damsite.

After final approval, M. O. Weaver, Inc., was given until August 1, 1947, to have the enormous aggregate and manufactured sand plant in full production at the rate of 250 tons per hour. This left them with a little over 90 days in which to purchase all additional equipment that was needed, work out the design of the plant and erect it for operation at full scale. Considerable time in the previous months was spent in working out a flow plan that would meet the approval of the U. S. Engineers. In preparing this flow plan, Mr. Peterson had the foresight to arrange a plant that could be operated all of the time even though some of the vital units had to be overhauled in case of a major breakdown, because when aggregate is required at the huge batching plant it is of vital importance that production be maintained at a steady flow.

Services of the author were secured as consulting engineer. The huge system of conveyors, special chutes, hoppers and special structures had to be designed and purchased. Numerous screens, crushers, electric motors, scrubbers and hammer mills had to be purchased and delivered to the job with the least possible delay. The most difficult task was locating 37 electric motors as a power line with transformers capable of supplying 1000 k.w. was being installed by the Grand River Dam Authority. The facilities of the James W. Bell Co., Cedar Rapids, Iowa, distributors of the Iowa Manufacturing Co. in the State of



Close-up of twin hammer mill installation below two 4- x 12-ft. double-deck aggregate screens in production line No. 5

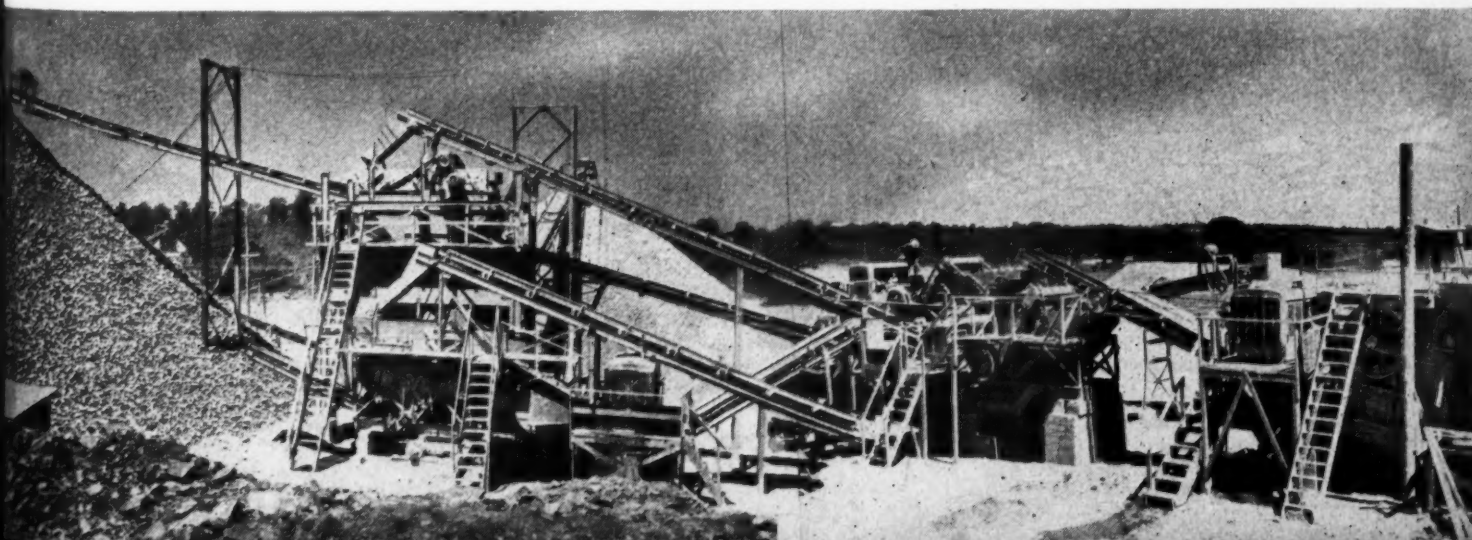
Iowa, were engaged at once, and through the splendid cooperation given the author by these companies, the vast job of expediting the necessary equipment was completed in time to enable M. O. Weaver, Inc., to have the plant in operation within the deadline. All the screening, crushing, and conveying equipment was Cedarapids equipment supplied by Iowa Manufacturing Co.

To outline briefly the enormous task with which we were confronted, 37 electric motors had to be located and purchased, eight 4- x 12-ft. Cedarapids horizontal screens had to be added to the three already mounted on three of the portable crushing units; three Cedarapids hammermills had to be incorporated in the manufactured sand line; two rotary scrubbers had to be located for washing the 6- x 3-in., 3- x 1½-in., 1½- x ¾-in., and ¾- x No. 4-in. aggregate; nine bin units had to be secured for handling the production, sizing and storage of the various aggregates; 16-ft. and 10-ft. air separators had to be secured for the sand production line, along with two me-

chanical feeders for use ahead of the tunnel conveyors underneath the two large stockpiles, and 19 conveyors for use between the various units had to be fabricated in a period of about 40 days in order not to hold up plant erection. Much credit must be given Mr. Peterson, his assistant, George Gibson, and the crushing plant superintendent, S. J. Herter, for the efficient manner in which they accomplished the huge job of plant erection.

Mr. Peterson had the foresight from numerous previous jobs to insist that all chutes, hoppers, special structures and supports be engineered to save valuable erection time. Foundations were first designed and located and the various large units set in place as quickly as possible with the aid of large cranes which were rented from the Johnson - Winston - Kiewit Company. Then the various chutes, special structures and supports were erected, together with the large conveyor system. Large scrubbers to handle the washing of the aggregate in production lines No. 3 and No. 4 (see plan and elevation flowsheet) presented a

stockpile for large rock (½- to 6-in.), sizing screens, scrubber unit, aggregate bins (300- and 150-ton) to the left



STONE SAND

real problem due to their scarcity and the short delivery period required. A 7- x 12-ft. Telsmith scrubber was located in Line 3, but Mr. Peterson and the writer had to convert a Cedarapids 5- x 24-ft. dryer (Unit 14) into a large rotary scrubber to handle the 1½-in. rock in Line 4, as all manufacturers of this type of equipment were unable to supply a scrubber suitable for the operation within the time limit specified.

Power Requirements

Power requirements for this crushing plant total 1800 hp., of which 500 is Diesel power and 1300 electric power. Gates multiple V-belt drives are used throughout to transmit power to every piece of equipment on the job with the exception of the two 4033 hammermill units and the water pumps which are direct-connected. Twenty of American Pulley Company's 13:1 speed reducers are used on conveyors, elevator and feeder drives. The 25 conveyors used in the system are Cedarapids conveyors.

Specifications for the grading of the coarse aggregates are as follows.

two Euclid dump trucks of 9.7 cu. yd. capacity, and eight Koehring Dump-

Screen-Size	Per Cent by Weight Passing Individual Screens			
	No. 4 to ¾"	¾" to 1½"	1½" to 3"	3" to 6"
7-in.				100
6-in.				90-100
3-in.			90-100	0-15
2-in.			20-55	0-5
1½-in.		90-100	0-10	
1-in.		20-45	0-5	
¾-in.	90-100	0-10		
¾-in.	30-55	0-5		
No. 4-in.	0-5			
Amount to Be Produced:	20%	15%	18%	20%

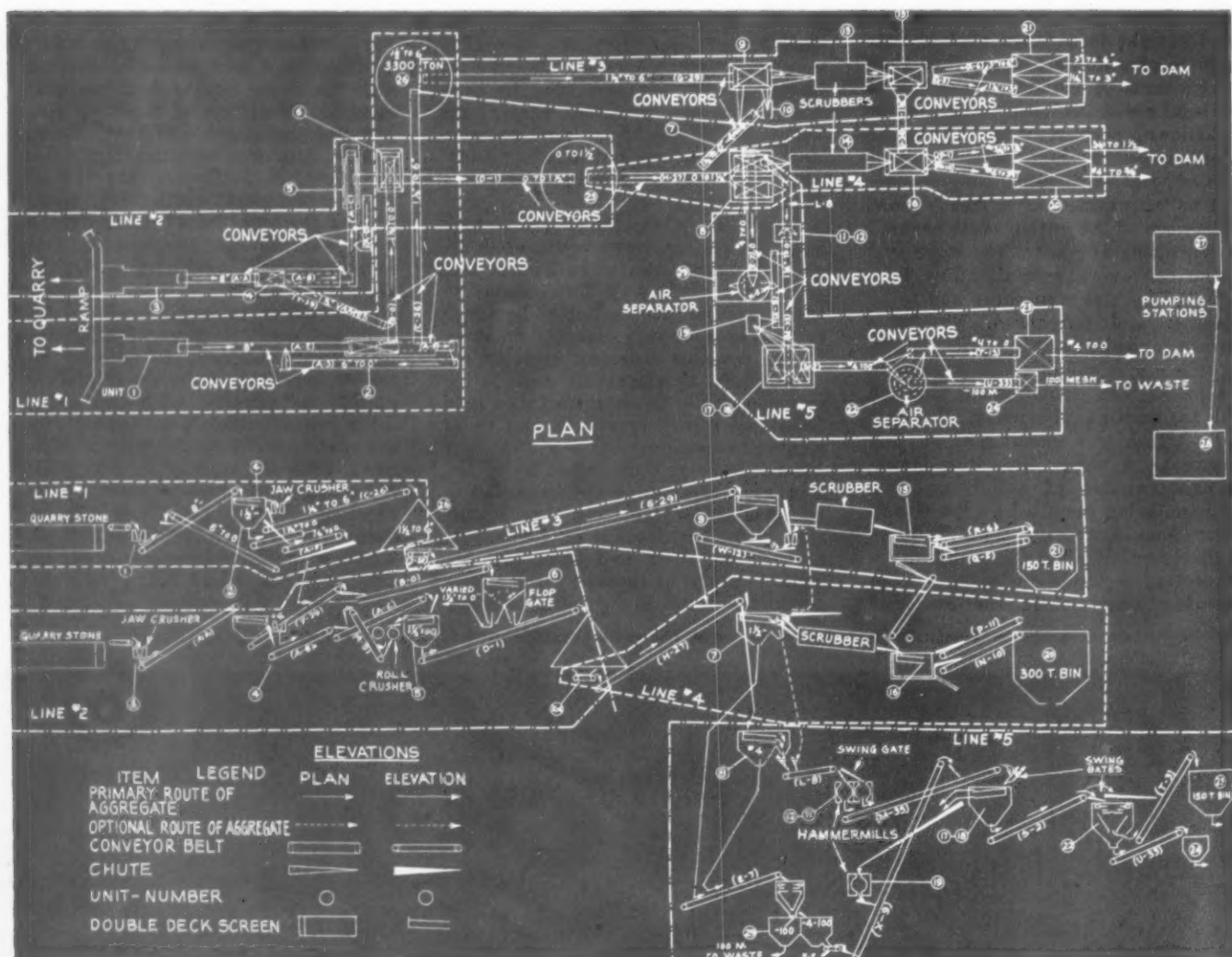
Quarry Operations

With a top face formation of about 30 ft. and a lower formation of about 20 ft., the quarry contains laminations of clay and shale between the two formations, making it necessary to work it in the two separate depths. The limestone was found to be of a very good grade and very desirable otherwise.

Stripping was done with a 1½-cu. yd. P & H shovel, a 2-cu. yd. P & H shovel, a 1½-cu. yd. Koehring shovel,

tors. The depth of the stripping operation ranged from 5 to 10 ft. and at this date over 125,000 cu. yd. have been removed.

Drilling and blasting operations are under the direction of William L. Kemp. With a crew of 12 men Kemp uses four Ingersoll Rand drills, several jackhammers, and two 500-ft. air compressors—one Gardner-Denver and one Ingersoll Rand. Normal staggered procedure in drilling the rock formations is followed in order to



Flowsheets of aggregates plant for Ft. Gibson Dam. There are elevation and plan flows for each of five production lines. Numeral and letter designations for equipment are referred to in the article

STONE SAND

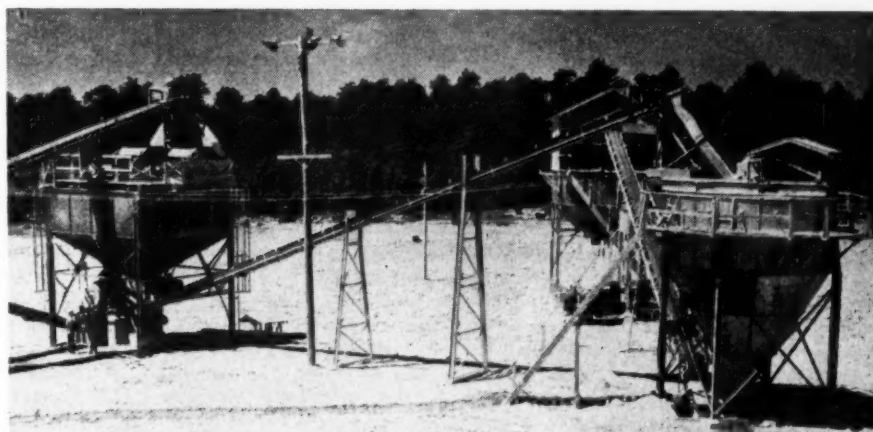
shoot the rock to the proper size and keep the secondary shooting at a minimum. Electric blasting caps wired to shoot simultaneously are used exclusively. About 2¼ lb. of dynamite are used for each ton of crushed aggregate produced. The quarry uses one 2-cu. yd. crawler-type P & H shovel and one 1½-cu. yd. crawler-type Koehring shovel for loading the six 6-cu. yd. Koehring Dumpers. Two additional Koehring Dumpers are used as standbys.

Production Line No. 1

Two large sizes of aggregate, which range in the 6- to 1½-in. size, are produced principally by Line 1, as shown on the flow plan. Stone is hauled from the quarry to the portable 25- x 40-in. primary crushing unit (No. 3) which consists of a 3½- x 10-ft. heavy duty apron feeder complete with charging hopper, a 2540 jaw crusher powered by a Caterpillar D13000 Diesel power unit, and a 36-in. under-crusher conveyor. Stone fed to the jaw crusher is reduced to approximately 8-in. Crusher throughs are carried on a 30-in. x 38-ft. feed conveyor (A-E) discharging to the feed end of the scalping screen on the Model BBB portable scalping unit which consists of a 4- x 10-ft. double-deck horizontal screen, a 1036 jaw crusher, a 30-in. x 21-ft. under-crusher conveyor (A-F), and a 24-in. x 57-ft. return conveyor (A-3), which is driven individually, the main crushing unit being powered by a Caterpillar D8800 Diesel power unit. The top deck of the screen has 3-in. screen wire in the intake section; 6-in. in the discharge section. The bottom deck has 1½-in. screen wire the full length.

Underneath the screen is a large receiving hopper with an adjustable swing gate whereby the aggregate rejected by the bottom deck of the screen may either be by-passed on to the conveyor B-O (Line 2) or returned to the under-crusher conveyor A-F. In this particular set-up, the swing gate is set to utilize the entire bottom deck of the screen so that all of the minus 1½-in. aggregate will discharge on to conveyor B-O. The 6- x 1½-in. which is retained on the bottom deck passes onto a side discharge chute which carries the finished aggregate onto the 30-in. x 118-ft. conveyor C-26. The plus 6-in. passes into the 1036 jaw crusher and is reduced to pass the 6-in. screen. This aggregate is carried by conveyor A-F onto conveyor A-3 which returns the aggregate to the feed conveyor A-E, thus closing the crushing cycle on this unit. The 6-in. x 1½-in. aggregate conveyed by C-26 discharges onto the 3300-ton stockpile (Unit 26).

Thus minus 1½-in. produced by both primary units (1 and 3) and moved by conveyor B-O discharges onto Unit No. 6 which is a 4- x 12-ft. double-deck horizontal screen mounted on an 8- x 18-ft. two-compartment bin.



Manufactured sand section (production line No. 5) of plant. To the left, is a 150-ton sand bin, over which are two screens with hammer mill below. To the right is the air separator

This screen, driven by a 15-hp. G. E. motor, has 1-in. screen wire on the top deck; ¼-in. on the bottom. Underneath the screen is a hopper with a swing gate for diverting any portion of the material screened out on the bottom deck plus all of the aggregate screened out by the top deck. An additional swing gate at the end of the screen permits all of the aggregate passing over this screen to be diverted to the compartment of the bin near the intake end of the screen. Thus, the amount of aggregate to be wasted due to the presence of argillaceous material, shale, etc., in this portion of the aggregate can be accurately controlled. The desirable portion passes into the compartment of the bin on the discharge end of the screen, and onto conveyor D-1 which transfers the minus 1½-in. aggregate on to the stockpile (Unit No. 25).

Production Line No. 2

Production Line 2 principally produces the 1½-in. aggregate. The quarry stone is hauled to a portable Model AAAA 2540 primary crushing unit, consisting of a primary jaw crusher powered by a Caterpillar D13000 Diesel power unit, a 3½- x 10-ft. heavy duty apron feeder complete with charging hopper, and a 36-in. x 27-ft. under-crusher conveyor, both of which are manually clutch controlled.

The primary crusher, set at approximately 6-in., crushes about 150 tons per hour, the throughs passing onto a 36-in. x 27-ft. conveyor (A-A) which carries material to the screen on a portable 1036 scalping unit (No. 4), powered by an International UD-14 Diesel power unit. Unit No. 4 consists of a 1036 jaw crusher, a 3½- x 5-ft. heavy duty horizontal scalping screen, a 30-in. x 20-ft. under-crusher conveyor (A-B), and a 30-in. x 25-ft. conveyor (Y-30). Openings in the screen are 4-in. on the top deck; 1-in. on the bottom deck. As the aggregate passes over the screen from the 2540 primary unit (No. 3), the minus 4-in. is immediately screened out and al-

lowed to pass on to conveyor A-B. The plus 4-in. is reduced to 4-in. by the 1036 jaw crusher. Minus 1-in. is screened out on the lower deck and is transferred to conveyor B-O on Production Line 1 by conveyor Y-39. The presence of conveyor Y-39 allows all minus 1-in. produced by the primary unit (No. 3) to be removed and eliminates the greatest portion of undesirable material at this point. Minus 4-in. produced by the 1036 jaw and that by-passed by the 3½- x 5-ft. screen is transferred to the 30-in. feed conveyor (A-C) on the portable 40- x 24-in. roll crusher unit (No. 5) which consists of a 42-in. x 12-ft. double-deck horizontal screen, a 40- x 24-in. roll crusher, and a 24-in. return conveyor (A-D).

This aggregate is then discharged onto the feed end of the double-deck screen which has a 2½-in. top deck and a 1½-in. bottom deck. The minus 1½-in. aggregate is immediately screened out, and the balance of the oversize is reduced to 1½-in. by the 40- x 24-in. roll crusher which is set at approximately 1-in. The crushed aggregate is transferred to conveyor A-D which conveys these returns back onto the feed conveyor A-C, thus closing the crushing cycle on this unit. The minus 1½-in. which is produced by this unit passes into the receiving hopper underneath the 3½- x 12-ft. screen which discharges onto the 30-in. x 85-ft. conveyor D-1 and is carried to the 3300-ton stockpile (Unit No. 25). This stockpile allows for variations in feed and also presents a supply of crushed stone for the final sizing, washing and manufactured sand production in the event of a breakdown on this line.

Production Line No. 3

This part of the flowsheet is for sizing, washing and final crushing the 6- x 3-in. and 3- x 1½-in. aggregates. Underneath Unit No. 26 (the 3300-ton stockpile for 6- x 1½-in.), is a 30-in. reciprocating type plate feeder which is enclosed below the ground level in a 10-ft. tubular tun-

nel. This feeder regulates the accurate flow of the material fed onto the 30-in. x 82-ft. conveyor (G-29), powered by a 25-hp. G. E. motor, and discharges onto Unit No. 9 which is a Model DDD sizing unit consisting of a 3½- x 12-ft. double-deck horizontal screen mounted on an 8- x 18-ft. three-compartment bin. The top deck has ¾-in. mesh; the bottom deck 1¼-in. On the discharge end of the screen, chutes with swing gates for diverting aggregate rejected by both the top and bottom decks are provided so that any portion of either the 6- x 3-in. or the 3- x 1½-in. sizes can be diverted into the 7- x 12-ft. Tel-smith scrubber (Unit No. 13), or into the 1236 twin-jaw crusher (Unit No. 10) for further reduction for the 1½-in. aggregate. The purpose of this control is to balance the output of these two sizes of aggregate. The 1½-in. that may have passed over the screens in Units 4 and 2 is screened out on the bottom deck and is transferred on to 24-in. conveyor (W-12) which carries the returns from the 1236 twin jaw crusher to conveyor H-27 in Line No. 4. The portion of 6- x 1½-in. aggregate diverted here discharges into the Tel-smith rotary scrubber. The scrubber, powered by a 100-hp. G. E. motor, is kept at the proper level with water, and the rock is retained in the scrubber a certain length of time to permit the argillaceous material, shale, and other undesirable particles to be removed. Aggregate then discharges directly onto a 4- x 12-ft. double deck screen equipped with spray bars for washing the aggregate. The top deck has ¾-in. openings; the bottom deck, 1¼-in. The finished sizes of 6- x 3-in. and 1½- x 3-in. pass off the top and bottom decks, respectively, and discharge onto the receiving hoppers on two 24-in. x 92-ft. conveyors (R-6) and (Q-5), each being powered by a 7½-hp. Century electric motor. It was found that the Tel-smith scrubber, due to its vigorous scrubbing action, caused about 20 per cent of the ag-

gregate to be broken below 1½-in. This made it necessary to install the 16-ft. bucket elevator (U-34) which is driven by a 5-hp. G. E. motor. Minus 1½-in. stone is flumed, with the waste water, to the foot end of this elevator which returns it to Line 3 on the final sizing screen (Unit 16) thereby eliminating any wasting of this aggregate.

As there was no permanent water supply near the quarry site, Superintendent Peterson built a reservoir about 1700 ft. from the crushing plant. To insure maintenance of the water supply, two 4-in. four-stage high pressure Gorman-Rupp water pumps were installed at Ranger Creek about 2½ miles distant. These are connected to a 6-in. pipe line which will be operated at different intervals in order to keep a safe level in the reservoir. A 6-in. high pressure split case Carver pump connected to a 150-hp. Fairbanks, Morse electric motor, delivers about 90,000 gal. per hour to the washing unit through an 8-in. supply line.

Production Line No. 4

Line 4 is the final washing and sizing section for the 1½- x ¾-in. and the ¾-in. x No. 4-in. aggregates, and the final diversion of the aggregate to be fed to Line 5 (manufactured sand). Underneath the 3300-ton stockpile (Unit 25), a 2½- x 3-ft. apron feeder, powered by a 3-hp. Master Electric variable speed gear-head electric motor, is enclosed below the ground level in a 10-ft. tubular tunnel together with the 30-in. x 128-ft. feed conveyor (H-27). This conveyor transfers the aggregate to Units 7 and 8 which are two Model DDD sizing bin units composed of two 8- x 18-ft. two-compartment bins, and two 4- x 12-ft. double-deck horizontal screens powered by 15-hp. G. E. motors. A two-way chute provided with a swing gate is located at the head end of (H-27), distributing the aggregate evenly on the feed end of

each 4- x 12-ft. screen. This makes it possible to control the flow of the aggregate on either screen so that the (sand) Line 5 or the washing section may be varied or cut off at a moment's notice. The bottom deck of each screen has No. 4 wire; the top deck has ¾-in., allowing the load to be split on the two screens.

On the discharge end of the screen on Unit 7 is a 3-way chute with three swing gates which permits the aggregate to be diverted to the sand, or to the washing sections and directly into the 5- x 24-ft. rotary scrubber, or the rejected aggregate from the top deck of the screen may be returned to the 1236 twin jaw crusher for further reduction. The scrubber is powered by a 75-hp. G. E. motor connected to the main transmission shaft by a Gates multiple V-belt drive. From the scrubber, the material discharges directly onto a 4- x 12-ft. double-deck horizontal screen equipped with spray bars where the final washing of the stone is accomplished; ¾-in. mesh is used on the top deck, No. 4 on the lower. The minus No. 4 material, consisting mostly of rock dust, clay, etc., is flumed away into the waste water line which returns the water to the reservoir. The aggregate is separated into 1½- x ¾-in. and ¾- x No. 4-in. sizes and conveyed to the 300-ton storage bin (Unit 20) by conveyors (P-11) and (N-10), respectively. The 1½- x ¾-in. and ¾- x No. 4-in. aggregate which is discharged from the screen in Unit 8 passes directly into the bin compartment and on to the 30-in. feeder (L-8) which regulates the flow to the entire manufactured sand line.

Manufacture Sand in Line No. 5

Manufactured sand totals 27 per cent of the entire production and must meet the following specifications of the U. S. Engineers:

Screen Size	Percentage by Weight Passing
No. 4	95-100
No. 8	80-90
No. 16	60-80
No. 30	30-60
No. 50	12-30
No. 100	3.5-10

In addition to the grading limits shown above, the sand must have a fineness modulus of not less than 2.40 or more than 2.90, and must not vary more than 0.10. The grains must not be more than five times the length of the shortest dimension. The engineers, who have a laboratory at the plant and one at Resident Engineer Frank Newell's office at the damsite, conduct regular tests every hour on the manufactured sand, and three or four times per shift on the four sizes of aggregate.

Line No. 5 is the manufactured sand section. Minus No. 4 aggregate, which passes through screens Nos. 7 and 8, discharges into the bin compartment near the feed end of each screen, and is carried to the 10-ft. Sturtevant



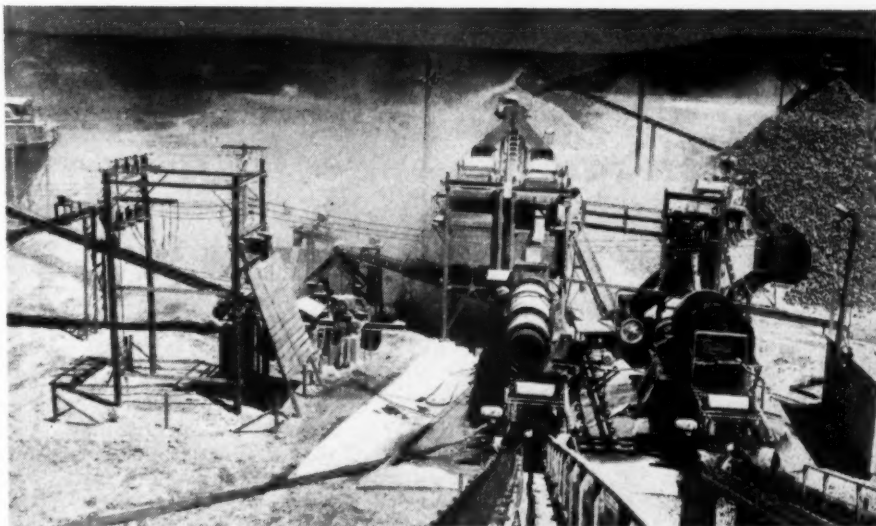
Left to right: Geo. L. Gibson, field superintendent; Geo. C. Hawkins, the author and consulting engineer; and L. H. Peterson, general superintendent, all identified with M. O. Weaver, Inc., aggregate producers for Ft. Gibson Dam

air separator which is mounted on two 30-ton steel bins. Minus 100-mesh material collected by the air separator is deposited in one of the bins and hauled to the waste stockpile by trucks. The minus No. 4, plus 100-mesh is fed onto the 24-in. conveyor (X-9) with an 18-in. apron feeder. This insures an even flow of material onto the sand line. These fines are produced from the crushers on the aggregate lines and contain many slivery and elongated particles. At this point the fines are returned to the main sand line to be reduced to a cubical shape by the 3033 hammermill (Unit No. 19) driven by a 150-hp. electric motor. The main flow of the sand line is controlled by the 30-in. belt feeder (L-8) and discharges into a two-way chute on top of the two 4033 hammermills (Units 11 and 12), as shown in one of the photographic illustrations.

These hammermills are each powered by 200-hp. electric motors, and the two-way chute has a swing gate for varying the flow of materials to either hammermill. Each hammermill is equipped with varied grate bars to produce the proper gradation of sand. The finished material is carried by conveyor (M-35) to a two-way chute, with a swing gate for varying the flow, at the feed end of the two 4- x 12-ft. double-deck "Ag"-special horizontal screens. (Units 17 and 18) mounted on a 150-ton bin. The bottom deck of screen No. 17 has No. 10 wire; the top deck, ¼-in. wire. The bottom deck of No. 18 has No. 4 wire; the top deck, ¾-in.

Oversize from the top and bottom decks of both screens are returned to the 3033 hammermill for further reduction, and transferred by conveyor (X-9) to conveyor (M-35) for recirculation over the sizing screens Nos. 17 and 18, thus closing the cycle. The final sized material from both screens is carried by 24-in. conveyors (S-2) to the 16-ft. Sturtevant air separator (see illustration) driven by a 75-hp. electric motor. The minus 100-mesh fines rejected by the air separator pass on to the 24-in. conveyor (U-33) which discharges into the 30-ton bin (Unit 24), and are trucked to the waste storage pile. Part of the material by-passes the air separator by means of a two-way chute with swing gates and, together with the finished product from the air separator passes on conveyor (T-13) to the 150-ton storage bin (Unit 33). Total sand production averages 70 tons per hour.

Finished aggregates are hauled to the damsite by truck from the three storage bins. The truck haul is under contract to Millay & McBride of Waco, Texas, using approximately 10 trucks, most of which are of the large semi-trailer type hauling about 16 yd. per load. The 4½-mile haul road was constructed over very rough terrain by the prime contractors, Johnson-Win-



Rotary scrubber installation with double deck screens mounted on bins immediately back of scrubbers. This is the washing and sizing section of the sand plant

ston-Kiewit. Approximately ¾ of a mile had to be cut down the side of a mountain at the entrance to the damsite. Aggregate for the haul road was produced by M. O. Weaver, Inc.

Concrete Batching Plant

The mixing plant at the damsite is a C. S. Johnson Co. unit. The plant proper contains overhead bins for four sizes of aggregate, two sizes of sand, limestone dust, air-entraining admix, cement and water. In addition to the plant, the Johnson-Winston-Kiewit Co. has erected a tower containing ice making equipment capable of producing approximately 200 tons of crushed ice per 24 hours. The ice is chuted from the hopper directly into the weighing devices of the mixing plant. Aggregate is cooled down to 50 deg. and held to 57 deg. when mixing.

The plant is set to batch automatically four sizes of aggregate, two of sand, limestone dust, air-entraining admix, cement, and water. The U. S. Engineers eliminated one size of sand and the limestone dust so that these two weighing devices are not operating. Mixer capacity is now four 2-cu. yd. Koehring mixers, charged by the automatic devices and discharged into a wet hopper capable of holding 4 cu. yd. of concrete. Aggregates from the five stockpiles are transferred to the overhead bins by a 300-ft. inclined belt conveyor which is fed by a 625-ft. tunnel belt conveyor running under the aggregate storage. The cement, received in bulk, is stored in a 7500-bbl. silo next to the mixing plant. It is unloaded into the silo and then fed into the overhead bins through a screw and bucket conveyor system. Admix is stored in an 8000 gal. tank immediately adjacent to the mixing plant and pumped from there into the overhead storage by a small electric pump. Water is supplied to the overhead tank through a pipe line

from the main elevated gravity type storage tank which is filled by a 150-hp. centrifugal pump pulling water from the river.

The concrete is being handled in 2- and 4-cu. yd. Blaw-Knox buckets hauled on specially prepared Euclids from the mixing plant to the pour. The Euclids are the standard 12-cu. yd. dumps with hydraulic and dump bodies removed and replaced with steel deck bodies to carry the buckets. Major pours are being made with two American Revolvers, Model 25-R, with a 125-ft. boom and with 4-cu. yd. buckets. Minor pours are being made with crawler crane with 2-cu. yd. buckets. Both Lima and Bucyrus-Erie cranes of 2½-cu. yd. capacity are used. Mixer capacity on the specified two-minute mixing time will top at about 175-yd. per hour.

Patents Available

FOLLOWING PATENTS, applicable to the non-metallic ore industry and which have been assigned to the Secretary of the Interior, are available for licensing:

Patent No.	Date	Title
2,185,224	1/2/40	Purification of Rock Minerals
2,297,689	10/6/42	Separation of Feldspar from Quartz
2,364,088	12/5/44	Core Drilling
2,407,651	9/17/46	Concentrating Fluorspar by Froth Flotation

Such licenses are customarily issued on a nonexclusive, royalty-free basis; with applications being made to the Solicitor, Department of the Interior, Washington, D. C.

Purchase Quarry

VALLEY QUARRIES, Taylorville, Ill., has been purchased by Sumner Gibson, Clarence J. Egan, Joe J. Buck, and Carrie Winter.

CONTINUOUS DISCHARGE Automatic Lime Kilns

Pacific Carbide and Alloy Co., Portland, Ore., manufactures lime for use in the production of carbide

By W. B. LENHART

SEVERAL YEARS before the outbreak of World War II, T. R. Ellerbeck, vice-president and general manager of the Utah Lime and Stone Co., Salt Lake City, Utah, and W. E. Heffernan, lime burning superintendent for the Utah Copper Co., Bingham, Utah, pooled their technical resources in an effort to design a lime kiln that would better meet the needs of the industry. In the December, 1941, issue of **ROCK PRODUCTS** considerable data on this type of kiln was published. At this same time the developers of the "Ellernan Calciner" as it is called, stopped most of the exploitation work on the kiln because of the War. However, when the war ended, work on development and manufacture of the kiln was resumed and several installations are going forward in the West and other sections of the country. One of these installations is that of the Pacific Carbide and Alloy Co., Portland, Ore.

As the name implies, the Pacific Carbide and Alloy Co. produces car-

bide, and burned lime is one of the essential chemicals in the manufacture of that product. A high calcium lime of a high degree of purity is required, but as most of the limestones in western Oregon are high in phosphorus, the company must obtain its supply from eastern Oregon where the carbide company purchases its stone from operators near Enterprise, Ore. In calcining stone for lime, a slightly overburned lime is desired; this overburn is limited to 2 per cent. Due to the ease of regulating the various factors that contribute towards efficient manufacture of lime in the Ellernan kiln, this uniformity of product is maintained. At the time of inspection the two Ellernan kilns had been in operation about six weeks and the operators were very well pleased with the performance.

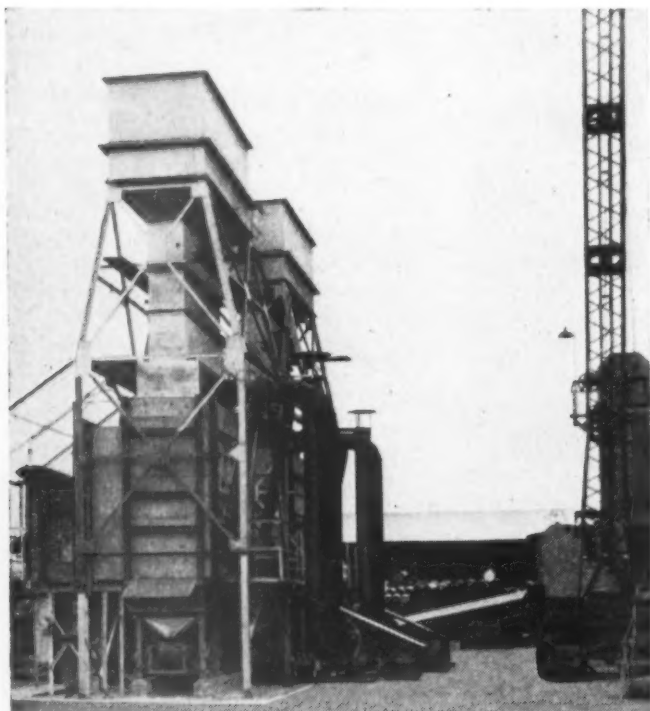
Two of these kilns are operated, both burning $\frac{1}{2}$ -in. to $1\frac{1}{2}$ -in. stone. Each unit produces 11 tons of lime per day with an oil consumption of 21 to 22 gal. per hour per kiln. At



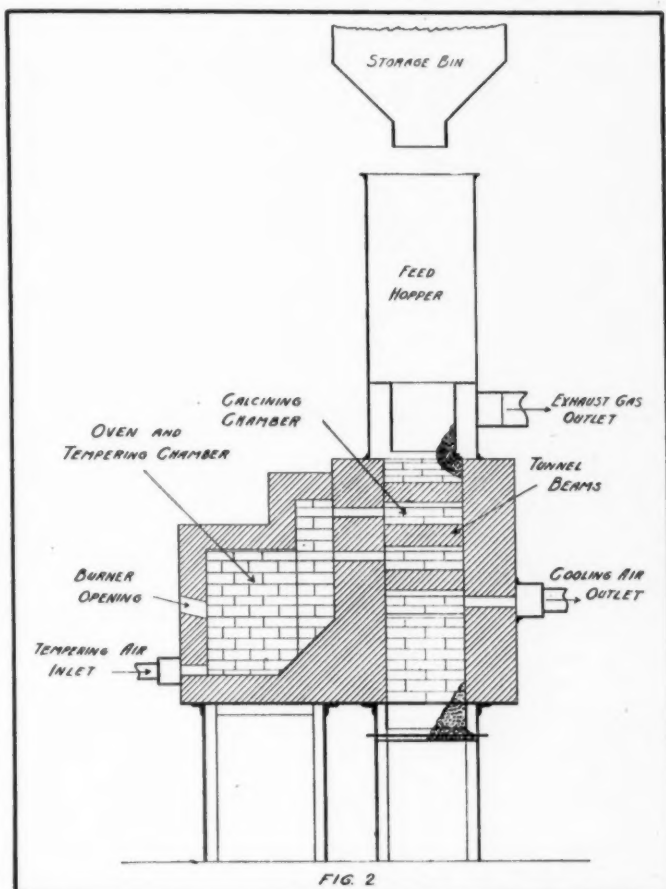
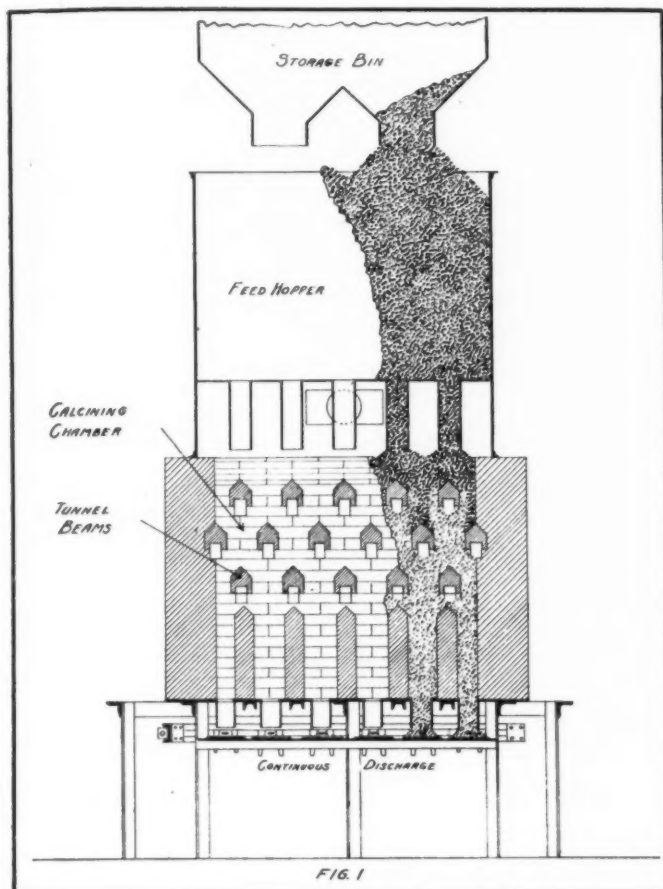
Discharge mechanism which delivers cold lime to off-bearing belt conveyor

present No. 300 oil purchased from the Standard Oil Co. of California is being used, but plans are being made to use No. 400 oil that will be preheated to 150 deg. F. by the use of exhaust gases. A Bowser oil meter is used.

The kilns have a total height of 35 ft. 6 in. which includes the height of the steel hopper over the burning sec-



Views of continuous discharge lime kilns. To the left, may be seen arrangements of ducts and fan, and to the right, the firing side with oil burners operating off platform and clamshell above feeding rock to kilns



Figs. 1 and 2: Elevation sections of continuous discharge lime kilns

tion. Thus the $\frac{1}{2}$ -cu. yd. Osgood (No. 200) clamshell with its 50-ft. boom can load the receiving hopper which has a capacity (23 tons) sufficient to run the kiln for 24 hours. A Blaw-Knox general purpose clamshell bucket is used. The same crane and operator unloads or otherwise handles the sized coke that is also used in the preparation of carbide. The crane has a Chrysler industrial engine as the prime mover.

How Kiln Operates

The kiln units are automatic and of continuous operating design with a continuous discharge of burned lime

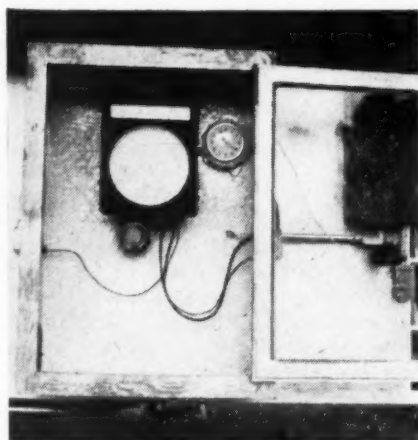
inducing steady flow of material through the kiln from the storage bins. The discharge mechanism consists of a reciprocating member under each unit that in turn is fed from six outlets or ports arranged in a single row over the moving member. Each of these ports has a controlled outlet so that the rate of flow through the kiln can be changed for regulating purposes. Flow can be faster in the center if desired, or faster at one or both ends so that with the use of this mechanism the flow can be balanced against the heat available at that point. The discharge mechanism has a variable speed drive so that the total tonnage can be varied as desired.

In operation, the amount of oil and the draft regulate the temperature; the oil flow is usually held constant. The discharge rate and feed rate are identical so if the draft is held constant a uniform burning condition results. At this operation, the crane operator loads the storage hoppers over the kilns each morning. There is no attendant other than an occasional inspection by the crane operator. Bristol and Merriam recording instruments are mounted at ground floor levels to record the temperatures of the exhaust gases and of the firing oven. The hot point for the latter is in the throat of the oven and tempering chamber where temperatures of 2300 deg. F. are maintained. Outlet

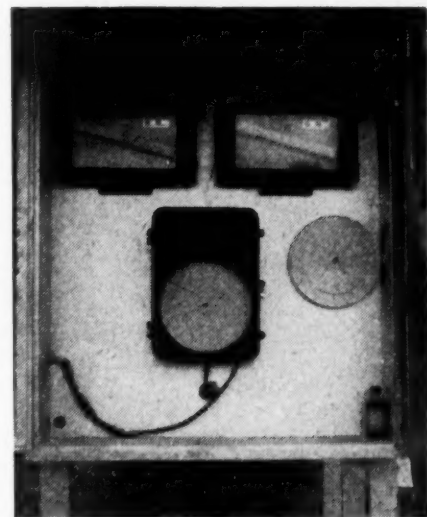
gas temperatures are in the 425 to 500 deg. range. The burned lime discharges to a horizontal 18-in. rubber belt and is stone cold at the point of discharge.

By referring to Figs. 1 and 2, the general operation of the calciner can be understood. The oven and tempering chamber shown in Fig. 2 is outside the calciner, and is fired with a Ray oil burner. The hot gas enters the calcining chamber through many

(Continued on page 104)



Cooling draft gage



Oil and draft gauges keep temperatures almost constant

FLUORSPAR Concentration

FLUORSPAR is one of the first non-metallic minerals to be concentrated commercially by froth flotation methods. Although it is still one of our most important and favored industrial minerals, many new developments will be forthcoming as the high grade coarsely crystalline ores are mined out.

The Rosiclare, Ill., district is famous the world over for its continued high tonnage production of metallurgical, ceramic and acid grade fluorspar.

However, since the tonnage has so rapidly increased in recent years to fulfill requirements of the steel, ceramic and chemical industries, which in turn are being shifted to serve new industrial areas, it has been necessary to locate more strategically situated fluorspar deposits.

Many new deposits have been found in the western and southwestern states, but as so often happens the ores are more complex and the metallurgical problems more difficult.

The impressive increase from the 177,000 tons in 1939 to about 400,000 tons during the peak year of 1944 will turn the attention of the research engineers toward the many problems which are to be expected in the concentration of the lower grade and more complex ores.

Preconcentration of Run-of-Mine Ores

A very interesting and exceptionally useful tool has been developed by taking advantage of the heavy media processes. These processes function by reason of the high apparent specific

By JAMES A. BARR, JR.

gravity pulps produced by the suspension of a heavy magnetic mineral such as magnetite or ferrosilicon in water. Any mineral lighter than the suspension will float and any mineral heavier than the suspension will sink.

Preconcentration is most desirable for the purpose of increasing the extractions of ore from a mine and for decreasing the overall cost of producing a flotation concentrate.

In many cases a mineral deposit cannot be economically beneficiated without the combination of heavy media preconcentration followed by froth flotation.

It is often necessary to preconcentrate the flotation feed not only for economic reasons but also for the purpose of increasing the selectivity of a flotation process to the point that it becomes a successful means of concentrating minerals quite similar in their flotability characteristics.

Fluorspar Products and Uses

Fluorspar concentrates are produced in three grades (1) Metallurgical, (2) ceramic, and (3) acid grade. The metallurgical grade refers to a concentrate produced by methods such as jigging, tabling, heavy media and froth flotation. In normal times specifications require 85 per cent CaF_2 and not more than 5 per cent silica. Metallurgical spar is used almost entirely by the metal industries for the desir-

able fluxing characteristics of fluorspar and to aid in the production of basic open hearth and electric furnace steels, iron foundry castings, ferro-alloys cement, etc.

The ceramic grade is more often entirely produced by froth flotation methods and must be not less than 95 per cent CaF_2 and not more than 3 per cent silica. Ceramic spar is used principally by the ceramic industry for producing special types of glass, enamel and ceramic frits.

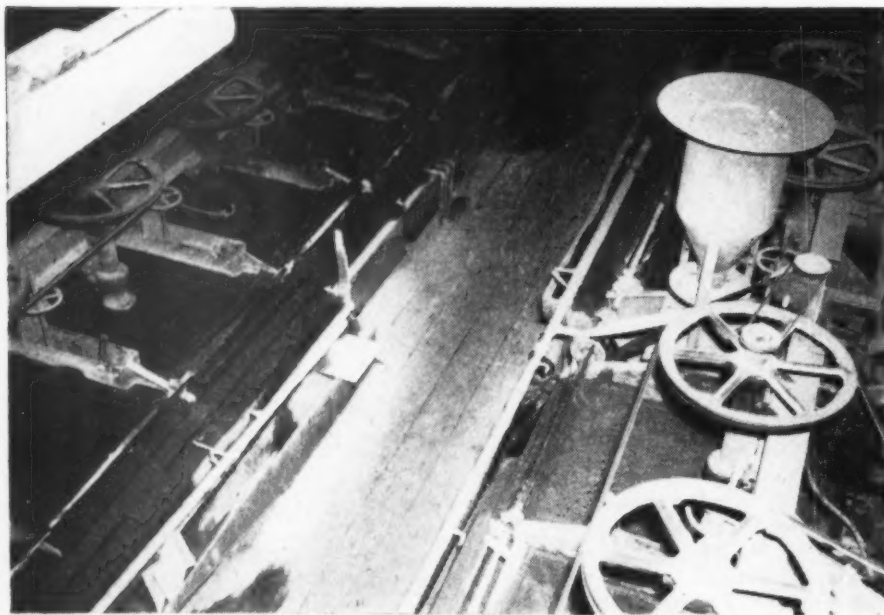
The acid grade of fluorspar of extreme purity must meet specifications of 97 per cent to 98 per cent CaF_2 and 1 per cent silica. During the war period the production of acid spar received its greatest impetus since it is essential to many new chemical processes. Without hydrous and anhydrous HF we would not have available desirable methods for etching and pickling. Hydrofluoric acid is an essential auxiliary reagent for producing high grade feldspar concentrates by froth flotation methods. Production of high octane gasoline, Freon and other organo-fluorine compounds, elemental fluorine gas, artificial Cryolite and many other uses disclosed at the recent symposium of the American Chemical Society, require an ever increasing tonnage of fluorspar concentrate.

Mineral Preparation

The largest deposits of fluorspar contain the minerals fluorite (CaF_2) and silica (SiO_2) with or without varying percentages of calcite (CaCO_3). There are many minor minerals which often make the problem of concentration much more difficult. Minerals commonly found include galena, sphalerite, barite, malacite, pyrolusite, hematite, pyrite and minor amounts of sulfide and non-sulfide minerals.

Regardless of the chemical analysis of the fluorspar ore, mineral liberation is essential to the proper functioning of any method of concentration. Siliceous ores are somewhat more difficult to grind to liberation and generally are more refractory.

The complex fluorspar ores are ground through 100-mesh or 200-mesh. This fine grinding causes a considerable percentage of slimes to be formed, and usually the fluorspar flotation circuit must be well adapted to function with appreciable amounts of —325 mesh particles in the circuit in the presence of minerals well down into the micron size range. It is this condition which caused so much dismay in the initial stages of development. The condition of the froth, ease of cleaning and recleaning the rougher



Fluorspar flotation section, Minerva Oil Co., Eldorado, Ill.

concentrate, consumption of reagents are all to a certain degree decidedly influenced by the presence of —325 mesh, plus 1 micron size particles of the mineral being concentrated, but more specifically so if the slime particles are weathered alteration products. Some ores which are highly weathered and possibly contain such minerals as haolinite and micaceous minerals are partially deslimed before entering the flotation circuits. Hydro-classifiers are used for the desliming step and thickeners are then used to thicken the flotation feed to approximately 30 per cent solids.

Sulfide Circuit

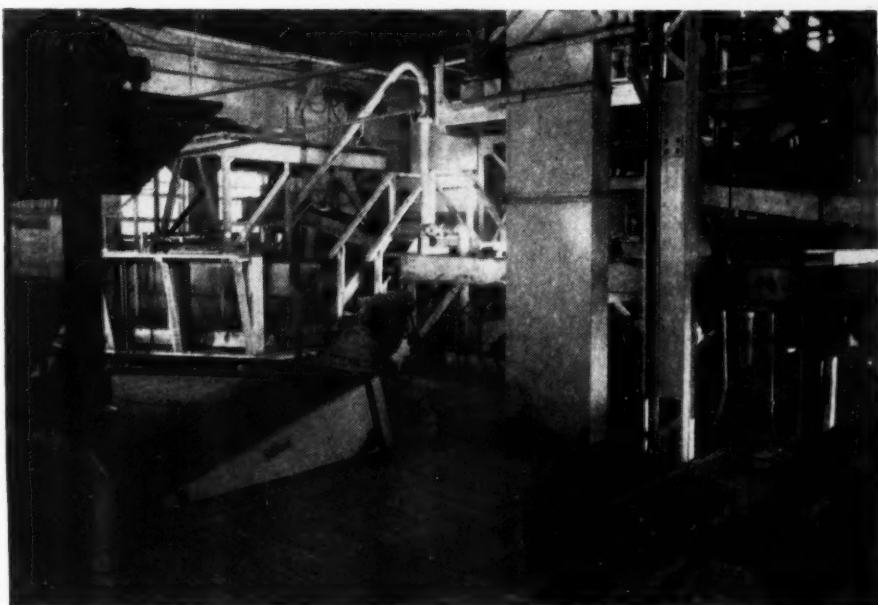
Whenever sulfides of lead and zinc are present in economic quantities, a circuit for the froth flotation of the sulfides is placed first in the series of flotation circuits. If more than one sulfide concentrate is desired then the sulfide float must be a selective circuit which may include several conditioners for different auxiliary chemicals, depressants and promoters, each followed by a separate set of cells for cleaning the concentrated sulfide mineral.

Fatty Acid Conditioning Circuit

Fatty acid consumption is greatly influenced by the temperature of the fluorspar conditioning unit operation. This is especially true in the case of oleic and linoleic acids with varying amounts of linoleic acid. This higher degree of unsaturation is more favorable toward lower conditioning temperatures, and is more desirable if the reagents are closely controlled to take advantage of the greater collecting power of a somewhat sensitive reagent.

The high temperature conditioning circuit is unique to the fluorspar industry for it is not often that conditions and concentrate values are such that this considerable expenditure for heat can be economically absorbed.

General practice requires the condi-



Looking toward separating cone in heavy media section of Rosiclare Lead and Fluorspar Mining Co. plant for processing fluorspar

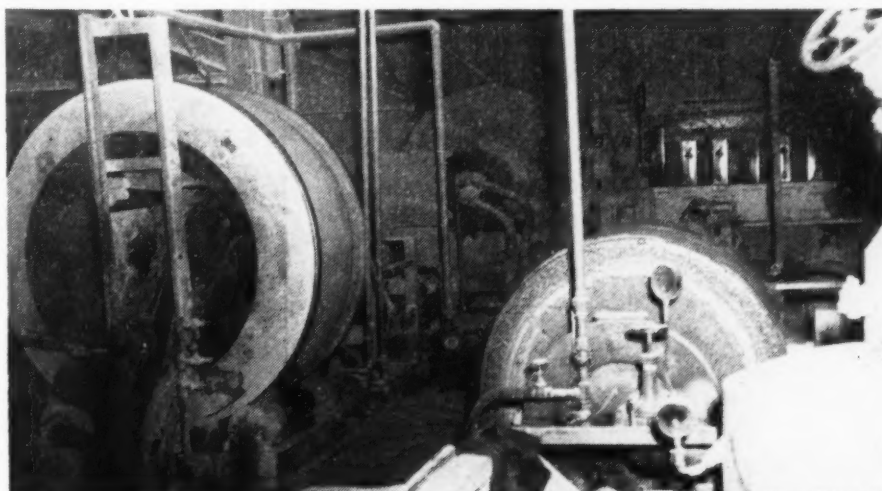
tioning pulp to be about 65 to 100 deg. F. The average, however, is about 85 deg. F. There have been some extreme cases in which a higher density pulp was actually brought to the boiling point but at best this is doubtful practice in view of the fact that we now have so many new chemicals and processes available which can be used even in ice water. The relatively new cationic flotation reagents are subject to neither temperature nor water conditions within limits found in normal flotation circuits.

Water Conditioning

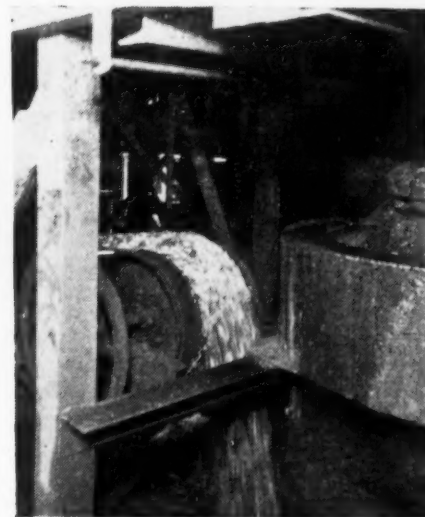
Zeolite or other water softeners are used to assure a very soft water to the fatty acid circuit of those mills treating a high calcite ore. It is not so essential for siliceous ores but often desirable. The effect is a decided decrease in reagent consumption and higher grade concentrates due to ef-



Discharge from washing screen, showing color difference of gangue float product (left), silica and calcite, and the translucent sink product, fluorspar, (right), the heavy mineral



Filters in mill for fluorspar processing, Minerva Oil Co. Filter in rear is for zinc



Crushed ore feed to heavy media cone, Rosiclare Lead and Fluorspar Co., Rosiclare, Ill.

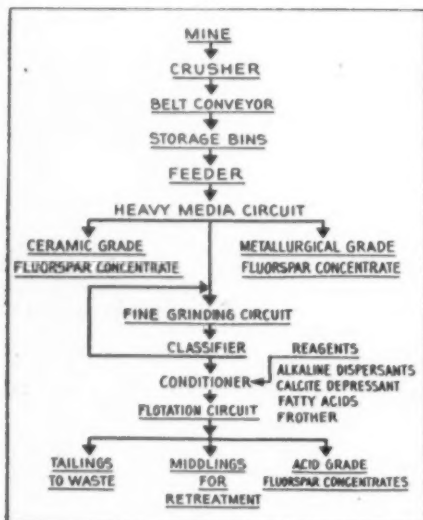


Fig. 2: Preconcentration and flotation circuit for coarse crystalline complex fluor spar ores

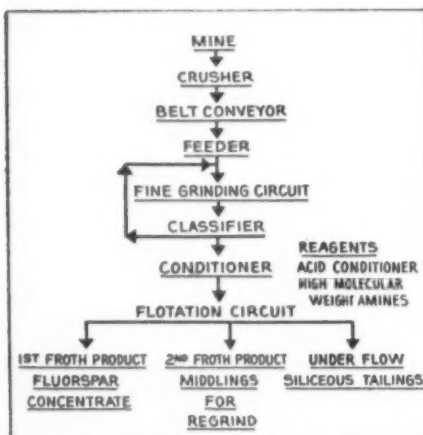


Fig. 3: Cationic (amine) flotation circuit for simple siliceous fluor spar ores

fective film removal in the cleaning circuits.

The Fatty Acid Flotation Circuit

If high solids are used in the conditioner, water is added to dilute the flotation feed to 30 per cent. The fatty acid reagents are added in small amounts to the flotation cells.

A typical fluor spar circuit contains large numbers of flotation cells since the flotation time is somewhat long and the cleaning and recleaning circuits numerous.

The separation of complex fine grained fluor spar ores is made more difficult because the grind is rarely sufficient for complete mineral liberation. This condition causes a very large middling load to circulate and interfere generally with the proper functioning of all the cells. The best solution for those middling particles actually liberated is to grind them in a separate middling grinding circuit. Often however it is possible to bleed off the circuit a blend of products to produce a ceramic grade and a metal-

lurgical grade concentrate or an acid grade and a ceramic grade concentrate. This in many cases is more economical than taking additional metallurgical losses induced by additional grinding.

The fluor spar concentrates are filtered and dried or filtered and pelletized if a very fine flotation concentrate is undesirable.

The Cationic Circuit

The cationic reagents have been used to successfully separate fluor spar from siliceous ores and under certain conditions from ores containing carbonate minerals. The principal objection is the acid condition which is required to depress the silica and the sensitiveness to some types of slime minerals.

Acid proof impellers and flotation cells have very largely overcome this objection, and the same conditions are met with complete success by the producers of high grade feldspar from alaspate.

The cationic reagents also have the advantage of functioning in hard water and low circuit temperatures.

Flotation Machines

Machines originally designed for sulfide flotation were first introduced to the non-metallic industry for the purpose of concentrating fluor spar. It was for this problem that many changes in flotation cell function were made to suit the peculiarities which are so numerous in the concentration methods for our industrial minerals.

It is indeed befitting that one of our most active elements should be a part of a non-metallic mineral first concentrated by froth flotation methods and an omen of things to come from such a strategic mineral.

Seek New Insurance Rate With Fireproof Insulation

REARDON INDUSTRIES, Cincinnati, Ohio, installers of Rockwool insulation, through observation, have concluded that fireproof insulation definitely prevents or controls fires, and that consequently, buildings insulated with fireproof materials should be given a lower insurance rate. In an attempt to start an investigation into this matter, the company sent the following letter to the Ohio Inspection Bureau:

"Gentlemen:

"On behalf of the home builders, property owners, and the insulation industry, permit us to request that the fire insurance rates be reduced on houses or other buildings which are insulated with Rockwool or other fireproof insulation.

"It has been shown in many cases that Rockwool when used alone, will definitely retard the spread of fire because it will not burn and in many instances, the fire goes only as far as the Rockwool and then stops.

"In the public interest, your examination of this request for a rate reduction on Rockwool insulated buildings will be timely, justified and appreciated.

Respectfully yours,
Reardon Industries, Inc."

Ag Stone Firm Formed

RAY E. MOLDER and J. M. BEMILLER recently formed a partnership as agricultural limestone jobbers in Arlington, Ohio. They will use the structures of the abandoned Molder Quarry for material storage and spreader truck maintenance. Mr. Molder is a son of the late Frank Molder, member of the original quarry firm.

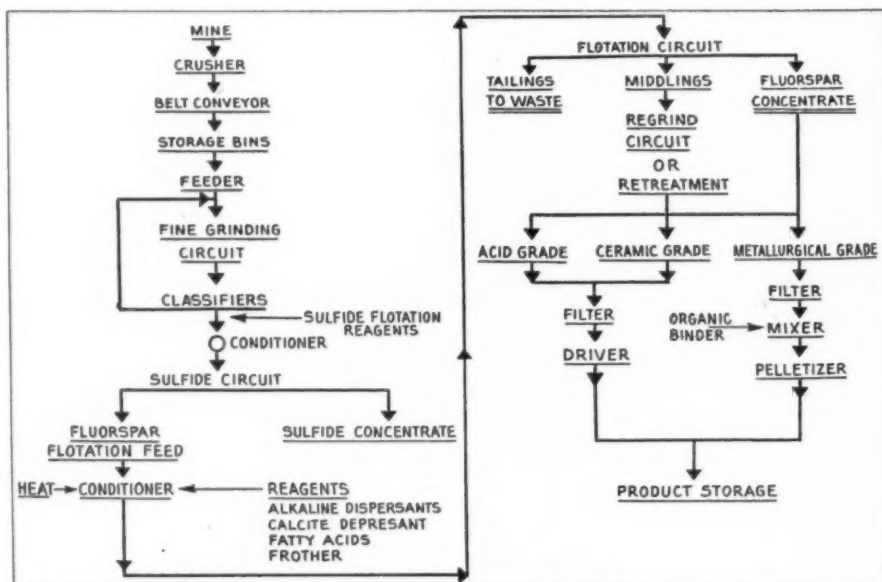


Fig. 1: Anionic (fatty acid) flotation circuit for concentrating finely divided complex fluor spar ores

Rock Wool

SAVING FUEL

In Mineral Wool Manufacture

Armstrong Cork Co. rock wool plant utilizes exhaust gases from cupolas to pre-heat combustion air

By BROR NORDBERG

COMMON PRACTICE among up-to-date plants in the mineral wool industry is to utilize waste heat from the melting cupolas for purposes of helping to generate steam to blow the melt into fibers. A saving is accomplished in boiler operating costs through the practice.

In one of the more recent installations, at the plant of Armstrong Cork Co., Beaver Falls, Penn., exhaust gases from two cupolas preheat the air for combustion in the cupolas, and a coke saving of some 15 per cent is

claimed. There was no advantage to be gained in using the gases, or heated circulating water, for developing steam, because there was a plentiful supply of steam available from the company's main plant, so this alternate procedure for re-use of heat was adopted.

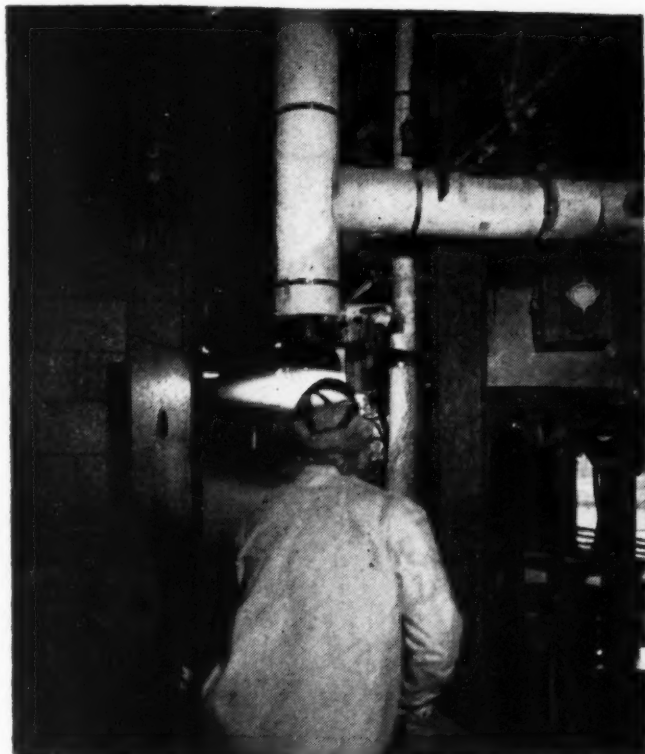
The plant manufactures loose wool and granulated wool from blast furnace slag for exclusive use in other products manufactured by the company. Production is three tons of wool per hour from both cupolas.

The plant has several innovations in design developed by the Whiting Corp. The melting operation involves the use of two 48-in. inside diameter vertical cupolas, water-jacketed all the way from the bottom plate to the top, with a 60-in. outside shell. These are probably the first cupolas to be jacketed to their full height.

Charging methods are accurate and are accomplished through the application of new methods. A specially-designed 20-cu. ft. charging bucket, suspended from a Kron scale travel-



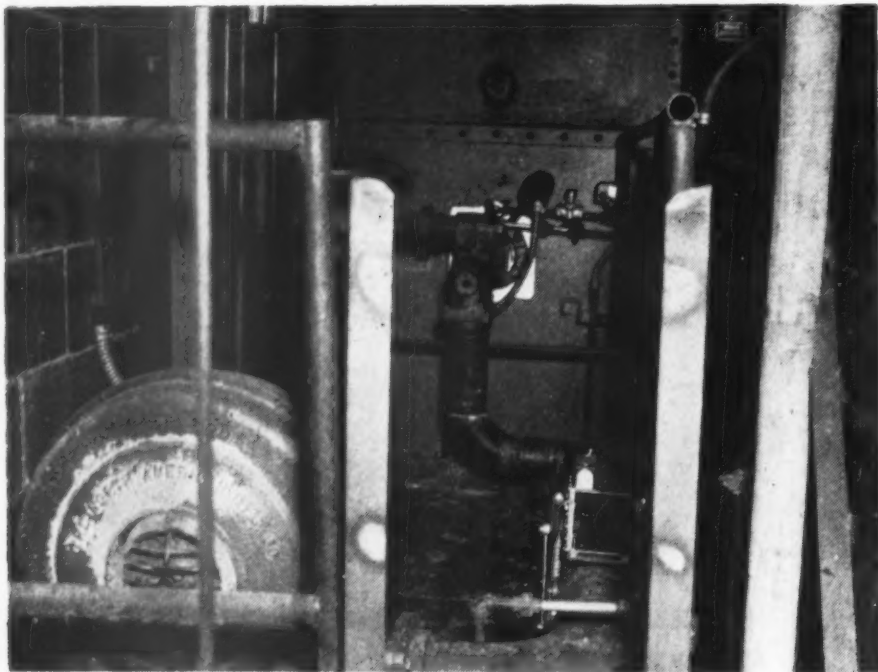
Cupola and air preheater, showing preheated air duct to cupola wind box



Left: Cupola installation showing wool collection chamber, slag notch, slag being blown into wool room and bottom of cupola



Right: Top of cupola showing charging method and hydraulic system. Special charging bucket with scale operating on a monorail system.



Rock wool cupola installation, showing combustion chamber and auxiliary gas burner

ling on a monorail system discharges a mixture of coke and slag into the top of either cupola. The bucket is filled by chutes from outside storage silos.

The charging bell shown on the accompanying layout is an important design feature, for it furnishes a positive seal to prevent escape of exhaust gases, which are withdrawn for preheating purposes, except when tripped in charging the cupolas. It also distributes the feed over the cross-sectional area of the cupola to advantage. The tendency is for the feed to flow to the periphery; leaving a more or less unpacked open center which facilitates gas flow. In charging, a bucket load of slag plus coke, is dropped into the hopper surrounding the bell by tripping a lever arm. The bell is tripped hydraulically by push button and automatically returns to the closed position, in three seconds, the time required for the piston to reach the end of its stroke. Charges of 1800 lb., for a fuel ratio of 5:1, are fed each 30 minutes.

Preheating Combustion Air

The firing equipment for each unit consists of the cupola, an air preheater with an auxiliary gas burner, an exhaust fan for the cupola and a draft fan to force air at room temperature through the preheater and combustion chamber into the melting zone. The heater is mounted on the combustion chamber, which is lined with $4\frac{1}{2}$ in. of firebrick and $1\frac{1}{2}$ in. of insulation.

A Clarage exhaust fan, rated 10,000 c.f.m. at 800 r.p.m. draws the exhaust gases through a 110-tube two pass W. Bros. heater and a Spencer blower forces air at room temperature through the heater (around the tubes)

where the air is heated and then piped to the wind box of the cupola. The blower is rated at 2400 c.f.m., 20 oz. pressure, but usually operates at 1600 c.f.m.

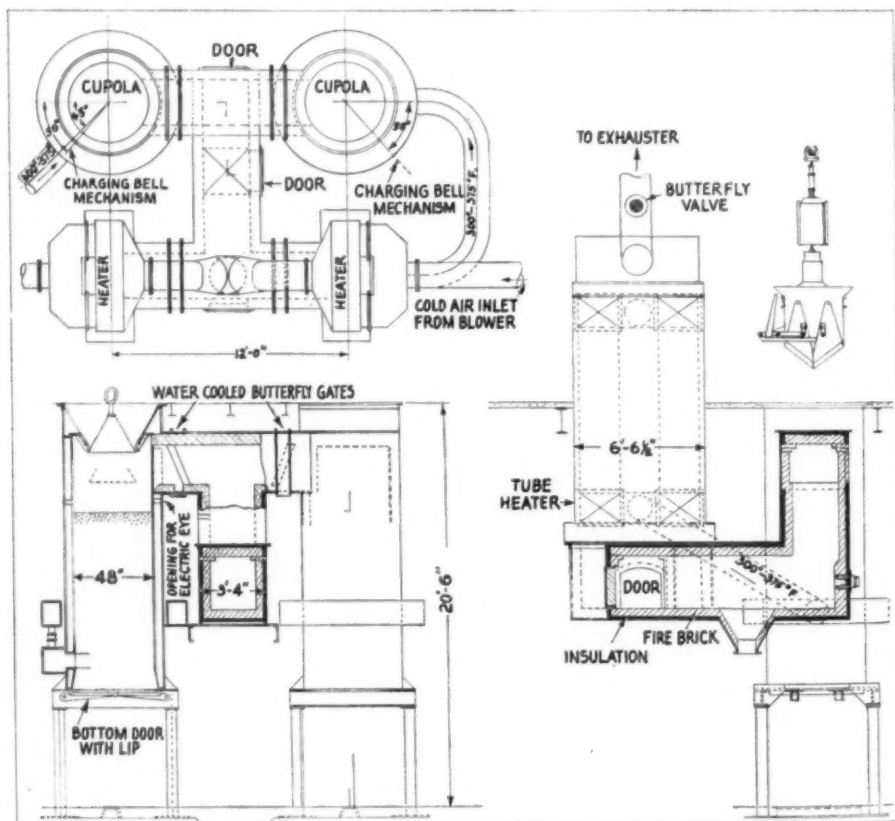
Exhaust gases as drawn from the cupola run as hot as 1400 deg. F. and there is provision to bleed in cold air at the heater coils so as not to exceed the 1100 deg. F. maximum for which

the heater was designed.

Gases exhaust from the combustion chamber after heat transfer at approximately 225 deg. F. and combustion air is introduced into the cupola at 350 deg. F. to 400 deg. F. The auxiliary gas burner, through thermostatic control automatically cuts in, if the temperature of the cupola combustion air drops to 350 deg. F. and cuts out when 400 deg. F. is reached. The system is flexible. By closing water-cooled gates, gases from either cupola can be diverted to the heater normally serving the other cupola.

Preheated air for combustion is forced into the cupola windbox which is just above the tuyres. Each cupola has nine tuyres, each of which has a valve for regulation of the volume of air flowing through to control the flame temperature as a means to attain uniformity in firing throughout the cupola area.

Each cupola has four blow caps. Steam from Armstrong's main plant enters a 6-in. header through a pressure regulator, set at 150 p.s.i.; then reaches the blow cap through individual throttling valves. The back pressure on each nozzle is indicated by a gauge and may be adjusted to any value up to the full line pressure. Cooling water from the water jacket is maintained by thermostatic controls over the water flow, to a temperature of 160 deg. F., since the water is used in a manufacturing process requiring large quantities of heated water.



Plan and elevation details of mineral wool cupola installation

LABOR RELATIONS TRENDS

Loop Holes in Wage Contracts

By NATHAN C. ROCKWOOD

CONTROVERSIES over the interpretations of clauses in union labor-management contracts offer many interesting sidelights on labor relations, and should prove helpful guides in drawing up, and living up to, such contracts. These controversies are usually settled by an arbitrator or arbitrators according to contract agreement, and it is in the decisions and recommendations of these arbitrators that we find material for this month's column.

Ignorance of the "Law" Costly

Here is the case of a trucking company, which in order to be fair, or to give the breaks, to its teamster union drivers, has been considering paid holidays not worked as time worked in computing weekly overtime. The contract clause provided: "On the following legal holidays when no work is performed, employees shall be paid straight time at eight-hours pay at the regular rate of pay (7 holidays named). When work is required on such holidays or Sundays, the rate of pay shall be double the regular hourly rate of pay." Another contract clause provided a guarantee of 44 hours' work per week.

After proceeding for several years on the assumption that the 8-hours on holidays not worked should be included in computing weekly overtime, the employer first learned in April, 1946, of a ruling made by the F.L.S.A. administrator in October, 1941, that paid holidays *were not* to be considered as time worked for the purposes of computing overtime. Accordingly, when the contract for 1946-47 came up for renewal the employer decided to abide by the F.L.S.A. administrator's 1941 ruling he had now discovered, and informed the union negotiating committee to that effect.

The union officers objected and the controversy was carried to an arbitrator appointed by the U. S. Conciliation Service, who ruled in effect that the trucking company must go on considering paid holidays not worked, as time worked, for the purposes of computing overtime, notwithstanding the administrator's ruling, because "it is well-known that lack of knowledge of the law is no defense." In other words, the employer had established an obligation by precedent, which he cannot now free himself from without agreement with the union—certainly a striking example of why *it does not* pay to be ignorant.

Paid Holidays Not Wage Increases

A concrete products company has a contract with a C.I.O. automobile workers' union local. The contract

clause on wages was reopened last spring when the wage controversy in the automobile industry was at its height. The contract provided that the employer was obligated to grant a wage increase equal to 80 per cent of the "next wage increase," granted by leading automobile manufacturers. The controversy arose over interpretation of the automobile industry wage increase, which it will be recalled from newspaper reports at the time was 11½ cents per hour plus certain paid holidays, which made the total raise the equivalent of 15 cents per hour. The union contended the employees should get 80 per cent of 15 cents and the company contended it should be 80 per cent of 11½ (or actually 12) cents, or the difference between 12 cents and 10 cents per hour.

The employer, by means of "a well prepared statement," in the language of the arbitrator, contended that, at the time the contract was made, both parties clearly understood that the only factor involved in the term "wage increase" was the hourly rate to the exclusion of "fringe issues," including the question of pay for holidays not worked. He contended that holiday pay is not a uniform matter, but is limited by certain clauses to length of service, work schedules and other considerations. A wage increase, he contended, is affected by overtime considerations while fringe issues of the holiday pay type are not. Moreover, the matter of holidays is taken care of in another part of this contract, which was not in dispute.

The union's argument contended that "it is common knowledge, broadcast by all concerned (newspapers, press releases, etc.) that the wage raises in question were 15 cents per hour rather than 11½ cents; that regardless of what form the raise took, whether an addition to the hourly wage, or as a paid holiday, or as insurance, or any other form, if the money found its way into the employee's pay envelope, it was part of the 'raise'; that when the two parties discussed the matter neither had any conception of the form that the controlling (auto industry) wage increases would take; that they talked about a wage increase rather than hourly rate."

The three arbitrators disagreed, but a majority (the one appointed by the union dissenting) decided in favor of the employer for the following reasons:

(1) The terms "wages," "wage rates" and "wage increase" always are used to mean hourly, daily or incentive wages, wage rates, or increases. In brief, they have not been

found used in any other sense, as for example in the sense of total economic benefits or total income, in any of the publications consulted.

(2) Publications, such as the *Machinists Monthly Journal* (union), go to lengths to establish the fact that paid vacations (and a paid holiday not worked is in fact a paid vacation) are not wages, and must be considered "as a legally recognized right in return for employment services rendered." Some (union) literature refers to paid vacations and paid holidays as "non-income objectives."

(3) Several publications refer to paid holidays as fringe issues and none refers to paid holidays (not worked) as part of the wage system. They are, however, mentioned as part of annual income in discussing guaranteed annual wage.

"Small Potatoes"

The interesting thing about this controversy is that probably not more than 100 employees were involved and the matter in dispute was 2 cents per hour or 16 cents per 8-hour day. It was costly in money, time and goodwill to both sides; but it shows to what lengths some union officers will carry what they think is a union advantage. Union literature, and the arguments of union lawyers or representatives are replete with the contention that paid holidays, and paid vacations, are the workers' just due, not as wages but as their right for working at all.

The employer in this case defended his position as a matter of principle because the cost to him could hardly have been a determining consideration. Another employer might have given in without argument; or another might have said: "Well, boys, why fight over 2 cents per hour, let's split the difference and call it quits." Who knows which is the best solution? Probably the answer depends not any more on the particular matter in controversy than on the general relationship between employer and employees in each particular instance.

Holidays Not Included in Vacations

In a case decided by an arbitrator appointed by the New York State Mediation Board, it was ruled that the employees on a paid vacation, who happened to have a holiday occur in that vacation period, must be paid for the holiday as well as for the vacation. The arbitrator reasoned that "there is no provision in the contract to the effect that the obligation in regard to holiday pay is connected with one concerning vacation pay and that either of them is to be neutralized when a holiday falls within a vacation period. * * * It cannot be argued successfully that the employees gave their consent to the employer's position when they accepted the vacation schedule, for the employees were not informed that they would not get their pay for the holiday. * * *

Chemist Corner

Quick Determination of Magnesium Oxide

By C. A. CLEM*

In Raw Materials

DETERMINATION of the MgO in the raw mix is generally necessary when the limestone contains a varying amount of magnesia which at times may run close to the permissible upper limit.

The usual gravimetric method is too slow for this purpose. Volumetric determination is complicated by the fact that magnesia nearly always is present as a mixture of carbonate and silicates. Ferrous oxide compounds in the raw mix also influence the volumetric determination of MgO.

It is, therefore, necessary to prepare the sample in such a manner that the magnesia will be present in a form which is readily soluble in weak HCl, and all iron compounds must be present as ferric oxide combinations.

The following method has given very satisfactory results. It has been in constant use as a raw mix check in combination with the acid alkali method for determination of CaCO_3 . With very little practice the analyst can determine MgO in raw mix, along with other duties, in less than 1 hour's time.

Solutions Required:

- 1: Trinitrobenzene Indicator: Dissolve 1.0 gm. Trinitrobenzene (1-3-5) C.P. in 100 c.c. ethyl alcohol (95 per cent).
- 2: Phenolphthalein: 0.4 gm. Phenolphthalein in 100 c.c. ethyl alcohol (50 per cent).
- 3: Sodium Hydroxide 2/5 N.: Dissolve 15.7 gm. NaOH in water. Add 10 c.c. saturated barium hydroxide solution (freshly filtered), and make up the total volume to 1000 c.c. If necessary filter again to remove a too heavy precipitate of BaCO_3 . This solution will be approximately 2/5 N. Standardize against Benzoic Acid (Acidimetric Standard) as furnished by the Bureau of Standards, or against an already prepared solution of 2/5 N. HCl. The MgO value of the NaOH solution is then calculated on the basis that 1 c.c. exactly 2/5 N. NaOH is equivalent to 0.008064 gm. MgO. This solution should be kept in a titration bottle with the burette attached to it. It should have the necessary absorption tubes filled with Soda-Lime to prevent

CO_2 getting in contact with the solution.

4: HCl—2/5 Normal

5: HCl—10 per cent

Where mix control is by acid alkali the same HCl, and NaOH solutions may be used for MgO if protected from CO_2 .

Testing Procedure:

Weigh off 2.00 gm. dry slurry. Place in a small platinum crucible and ignite in Hoskins Furnace in such a manner that all iron compounds are oxidized. Ignite strongly for 10-15 minutes. (1000 to 1200 deg. C). Cool in desiccator and transfer contents of crucible to a 500 c.c. flask. Rinse crucible with about 15 c.c. 10 per cent HCl and water. Break up the lumps in the flask and boil until all dark particles are dissolved. Wash down sides of flask with about 25 c.c. hot water. Then add cautiously 3.0 gm. CaCO_3 (C.P., precipitated) weighed to nearest 0.1 gm. Dilute to about 150 c.c. and boil for about 10 minutes. Cool under tap and transfer the liquid to a 200 c.c. measuring flask. Fill to 200 c.c. mark with washing water from boiling flask.

Filter off exactly 100 c.c. through a dry filter, throwing away the first 20-30 c.c. which are used for rinsing the measuring cylinder.

Pour the 100 c.c. liquid into a clean titration flask. Rinse out the cylinder and add this water to the flask. Bring to boil and add about 10 drops Trinitrobenzene indicator. Titrate while at boiling point with the special 2/5 N NaOH solution.

The titration must be done in steps. First add 2 c.c. NaOH and bring to boil. Then continue adding 0.6 c.c. NaOH at a time and bring to boil between each addition. Continue doing this until pink color appears which does not fade away by boiling for about 1 minute. Record amount of NaOH used. Cool liquid under tap, transfer to 200 c.c. measuring flask and make up to mark. Filter off exactly 100 c.c. through dry filter as described above, and pour this 100 c.c. into titration flask. This 100 c.c. liquid is used for determining the amount of excess NaOH used in the original titration.

Procedure:

Add about five drops Phenolphthalein to the liquid. Set the burette with

2/5 N. HCl at zero and add HCl until pink color disappears. Use a slight excess of HCl. Then titrate back with NaOH until faint pink color. Read both burettes.

Example:

First Titration: 5.1 c.c. NaOH was used to give pink color which did not fade away on boiling.

Then make up to 200 c.c. and filter of 100 c.c.

Second Titration: 0.8 c.c. 2/5 N HCl added to eliminate pink color of Phenolphthalein.

0.2 c.c. 2/5 N NaOH was used to bring back faint pink color.

$0.8 - 0.2 = 0.6$ c.c. NaOH left over in 100 c.c. liquid.

$0.6 \times 2 = 1.2$ c.c. NaOH in excess in original 100 c.c.

$5.1 - 1.2 = 3.9$ c.c. NaOH used for precipitating the MgO in original 100 c.c. liquid.

$3.9 \times \text{MgO-factor (say 0.81)} = 3.159\%$ MgO (Report as 3.2% MgO).

REFERENCES

- (1) *Concrete*, Vol. 39, No. 6, December, 1931.
- (2) *Proceedings of A.S.T.M.*, Vol. 35, page 772.

Concentration of Beryl Ores

LOW-GRADE WESTERN BERYL ores have been successfully concentrated by methods developed at the Inter-mountain Experiment Station, Salt Lake City, Utah. Beryllium is employed principally as an alloy with copper, giving it toughness, hardness and good electrical and heat conductive properties. Beryllium copper is widely used in aviation and fire control instruments.

Three metallurgical techniques were used by the Bureau in concentrating beryl, and the tests indicated that the procedures developed were flexible and probably adaptable to other ores. The report includes detailed data and information on all tests. A copy of Report of Investigations 4071, "Beneficiation of Western Beryl Ores," may be obtained free from the Bureau of Mines, Department of the Interior, Washington 25, D. C.

Correction

THERE WAS AN ERROR in mathematical signs in Table I in the article "A Method of Designing Portland Cement Raw Mixtures" by L. A. Dahl, page 114, in the October issue of *ROCK PRODUCTS*. In the column headed "Operations," the plus signs in the lines for equations 9 through 12, 16 through 18, 21 and 22 should be division signs. A division sign should also replace the plus sign in the first line below the table; that is, Eq. 23, $v = 1.0377 \div 1.4911$.

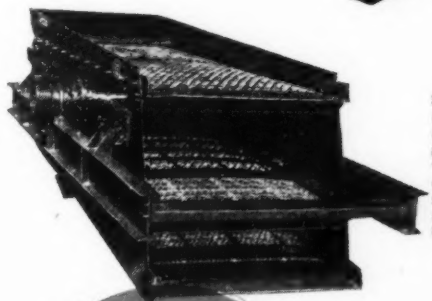
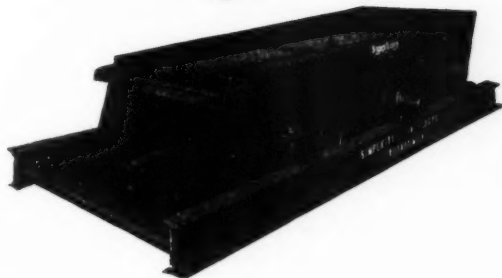
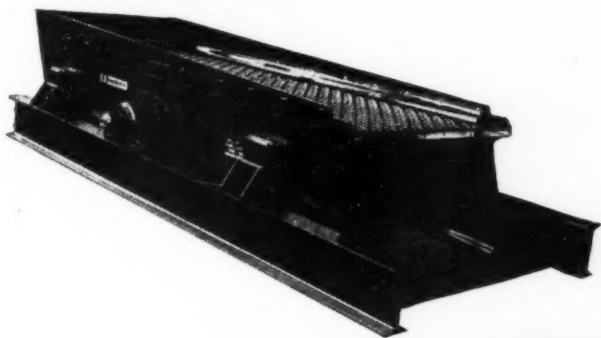
ALUMINUM ORE Co., St. Louis, Mo., fluorspar division, is engaged in prospecting in the Half Haw fluorspar tract near Mexico, Mo. A Buda power auger is being used in this work.

*Chemical Engineer

Do You Have A Screening Problem? Solve It!

You'll find the answer to your most difficult screening problems in the smooth, low-cost, efficient performance of Simplicity Gyrating Screens. They are available in single, double, and triple deck models ranging in size from 2'x3' to 5'x14' for sizing and separating virtually every type aggregate. Send us your requirements and we will recommend the specific model that will lower your screening costs and increase your profits.

Here are 3 big reasons why you can depend on Simplicity Gyrating Screens to increase your production and profits!



Simplicity Gyrating Screens are now represented in Canada by Canadian Bridge Engineering Co. Limited, Walkerville, Ontario. Canadian readers are urged to submit their screening problems to Canadian Bridge for recommendations, without obligation.

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SIMPLICITY GYRATING SCREENS

DESIGN. Gyrating is accomplished by a counter-balanced eccentric shaft that perfectly balances the weight of the entire screen deck assembly—assuring positive, smooth action. Rubber corner supports for screen. Screen cloth held positively taut 4-ways.

CONSTRUCTION. All steel construction, with supporting frame made up of heavy I-beams tied together with strong channels. Large diameter eccentric shaft made of solid alloy steel. Gyrating assembly carried by heavy duty ball or spherical roller bearings in dustproof, water-proof housings.

PERFORMANCE. A St. Louis gravel plant screens 5,000 lbs. of aggregate every 90 seconds with a 4-deck 3'x10' Simplicity. Another plant sizes 800 tons of crushed stone per hour with a 5'x12' heavy duty double deck Simplicity. In more than 2500 plants here and abroad, these records are being matched or bettered by Simplicity Gyrating Screens.

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Industrial Sand

Higher Freight Rates, Car Supply, and Foundry Sand Tests

National Industrial Sand Association holds fall meeting at Grove Park Inn, Asheville, N. C.

ALL who attended the Fall meeting of the National Industrial Sand Association at Grove Park Inn, Asheville, N. C., expressed their pleasure in the beautiful surroundings and excellent program arranged for this meeting. In spite of its inaccessible location, for some of the members, the attendance nearly reached the record of the last meeting at Hot Springs.

Foundry Sand Tests

PRESIDENT GREGORY opened the first session on Wednesday morning by welcoming the members, and then turned the session over to C. M. Hardy, who presided during the presentation of the report of the Committee on Foundry Sands. Stanton Walker led off in the discussion on the New Tentative Standards for Grading and Fineness of Sands which is being promulgated by the American Foundrymen's Association. He introduced R. E. MOREY, metallurgist, who told about the new test procedure, using both the sieve shaker and the cone. Stanton Walker criticized the overlapping test procedure outlined in the new A.F.A. Handbook, commenting on the difficulties of reproducibility. He referred to Mr. Murphy's tests (Industrial Silica Corporation), a member of the subcommittee, which showed no substantial difference between cone and sieve tests. A letter was sent to Dr. Ries covering these and other criticisms of the Handbook

standards, a copy of which will be sent to the membership.

Mr. Morey outlined in considerable detail his simplified test procedure. He told of his experiments using the pipette method, sedimentation method, specific gravity method, and Wagner turbidimeter to determine fineness. The hydrometer method to determine clay, finally adopted, was described in considerable detail. Mr. Morey simplified the procedure by developing accumulative curves for determination of fineness. These curves are within the range of 20 to 270 mesh or 53 micron. On the question of time involved in making the test, Mr. Morey said that it could be made in 20 minutes, from the sampling of the car and the completion of the test, not counting drying time. Considerable comment developed as to the difference in Rotap and Coombs tests, President Gregory pointing out that his company's experience was that they were both uniform. E. C. Sawyer of Ayers Mineral Co., said that the mounting of the test sieve would cause a difference in the test. Mr. Morey also told about his studies of a standard sand which would facilitate shake-out. President Gregory complimented Mr. Morey for contributing methods of test which would lead to simplification and greater accuracy.

HENRY C. THORNTON, chairman of the Hygiene Committee, presided at the open meeting of member companies



J. M. Strauss talking over a problem with V. P. Ahearn

producing ground sand. This meeting was called to discuss the problems involved in bagging and bulk car loading of ground sand. Called in consultation at this meeting were C. H. Hartman, technical director, Bag division, and R. P. Bushman, in charge of Machine and Engineering division, St. Regis Paper Co., and W. C. L. Hemeon, head engineer, Industrial Hygiene Foundation of America.

Increased Rail Rates-Workmen's Compensation

STERLING FARMER presided at the Thursday morning session following the open meeting of ground sand members, and introduced Wm. W. Collin, Jr., counsel for the association in Ex Parte 166 of the Interstate Commerce Commission. He summarized the conditions involved in last year's case which resulted in the granting of a 13.7 per cent increase and a net increase of 12¢ a ton. The latest petition of the railroads on September 5 requested a 38 per cent increase in Official territory and a 28.2 per cent increase in South and Southwest territory with a maximum of 60¢ and a minimum of 30¢. The minimum, however, only applies in movements under 70 miles. The railroads recently asked for an immediate straight 10 per cent surcharge increase of 10 per cent (recently granted), and the request for a 38 per cent increase will be heard separately. Mr. Collin expressed the opinion that the 10 per cent increase would be granted with possibly only 5 days' notice. The increase for the country will amount to 22.5 per cent in revenue for the railroads, and the industry's increase would be 25 per cent. This is double the increase of last year for the industry. Mr. Collin revealed figures based on industry studies made by the association that the length of haul would be materially decreased by the introduction of these higher rates. It also was pointed out that another result will be a greater

(Continued on page 100)



On the veranda at Grove Park Inn may be seen S. E. Doster and Joel G. Pearson of Standard Sand Co., new members of the Association

7 facts about the *NEW GULFLUBE MOTOR OIL* *H.D.*

For Automotive Diesel Engines and Gasoline Engines in Heavy-Duty Service

1. You'll get cleaner engines and longer engine life with Gulflube H. D.

In automotive Diesel Engines, you avoid high temperature sludge, piston varnish, lacquer, and stuck rings. You get a minimum of fuel soot deposits.

In gasoline engines in heavy-duty service, you avoid deposits and ring sticking due to oil oxidation—also minimize other harmful deposits not caused by oxidation of heavy ends of unburned fuel which contaminate the crankcase lubricating oil.

2. You'll get lower maintenance costs and higher availability—

With less wear, you get lower maintenance costs and less time out of service.

3. You'll get minimum oil consumption— Rings stay clean and free with Gulflube H.D., insuring better compression and proper oil control.

4. You'll avoid bearing corrosion— Gulflube H.D. is entirely noncorrosive to copper-lead or other alloy bearings.

5. You'll assure minimum drag and frictional resistance when starting in cold weather—

Gulflube H.D. has low pour point and a high viscosity index.

6. You'll get freedom from oil foaming in the crankcase—

Gulflube H.D. contains Gulf's patented anti-foam agent, which prevents crankcase foam under all conditions of speed and temperature.

7. You'll get a high-quality paraffin base, full detergent motor oil.

To find out just exactly how GULFLUBE MOTOR OIL H.D. may benefit your particular operation—consult one of Gulf's trained automotive Engineers.

Merely contact your nearest Gulf office. We'll see that an automotive Engineer calls on you whenever convenient.

He'll inspect your fleet. Look over your operation. Then make his recommendations.



Gulf Oil Corporation—Gulf Refining Company

DIVISION SALES OFFICES:

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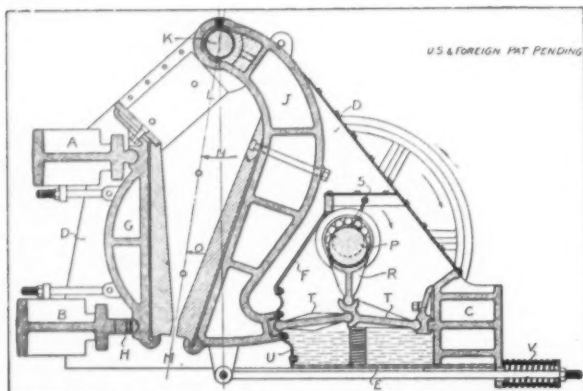
Switch to

GULFLUBE MOTOR OIL H.D.

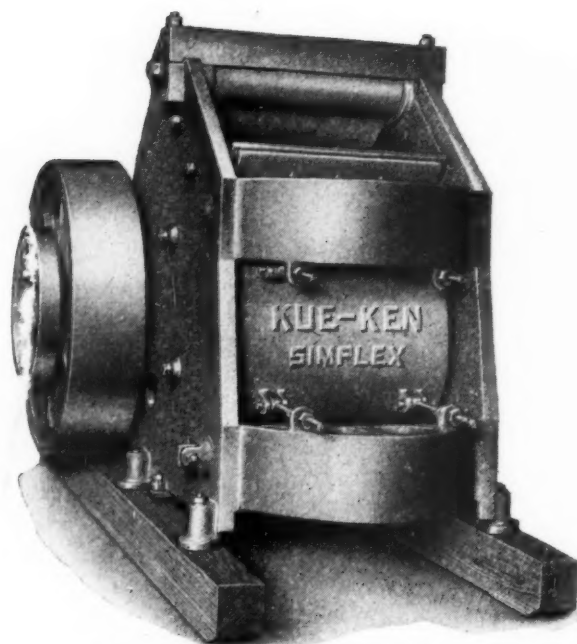


COMPARE

MODERN **KUE-KEN*** DESIGN WITH
ORDINARY CRUSHER DESIGNS
WHICH HAVE REMAINED UNCHANGED
FOR ALMOST 90 YEARS.



Referring to the above sectional view, the swing jaw "J" hangs freely on the hinge pin "K," which is securely fastened in the frame. Oil bath lubrication to the bearings and thrust faces, with an exclusive type positive seal, is provided at this important point. (Oil once every 6 months.) The location of the hinge pin on the line "LM," which passes thru the center of the crushing zone, gives patented KUE-KEN crushing motion; i.e., "crushing without rubbing." Jaw plates last several times longer and power requirements are less than any other crusher operating under the same conditions. The mechanism to operate the swing jaw is strikingly simple. First, there is the eccentric shaft "P" mounted in two self-aligning roller bearings pressed in the steel side



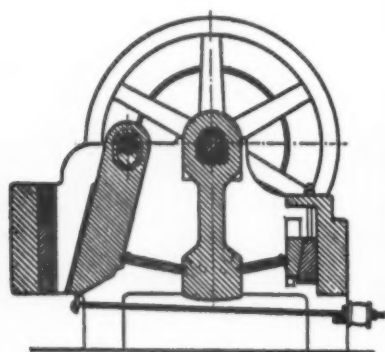
Above we show a 30"x15" KUE-KEN Simplex. Notice the clean, smooth design of this modern up-to-date crusher, which has all mechanism sealed in oil. This crusher requires oiling once every 6 months! Capacity is 50 to 100 tons per hour with 15 to 30 HP, depending on material crushed.

frames. This eliminates the usual bearing caps and bolts. This shaft has an exceptionally long "throw" on the eccentric, permitting the two toggles "T" and "T" to be set in the most desirable and relatively flat position. Note that the toggles are inverted, as compared to the old-style Blake type crushers, and impart the crushing stroke to the swinging jaw when *pressed down* by the pitman "R." This pitman is a light and strong steel member always in *compression*, with the upper end bearing against the lower side *only* of the eccentric shaft. The lower end of the pitman rests in a groove formed on the top of the rear toggle, and does *not* pass thru or between the toggles. Our design eliminates the usual heavy pitman bearing caps, bolts, shims and water jackets.

Our pitman is about one-tenth the weight of others, so that we can use a long stroke eccentric and flatter toggles to get greater leverage and consequently lower bearing pressures. The shaft, pitman and toggles are enclosed in dustite, oiltite case (Oil once every 6 months). At Present these sizes are available: 12x6 - 16x8 - 24x10 - 30x15 - 36x10 - 36x12 - 36x20 - 42x25. These features, with perfect lubrication by both pump and splash systems, permit high speed operation, so that KUE-KEN crushers run cool at 350 to 400 crushing strokes per minute or 50 to 60% faster than old-style crushers. More crushing strokes per minute mean greater capacity and more evenly crushed rock.

Bulletin 602 describes KUE-KEN crushers up to 50 tons per hour capacity. For larger sizes, ask for bulletin 603.

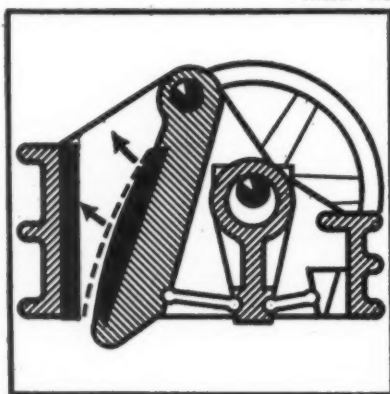
U. S. and foreign patents granted and pending.



UNCHANGED FOR ALMOST 90 YEARS

Above to the left is shown a sectional view of an early Blake-motion crusher. Invented in 1858 by Eli Whitney Blake, this design remains practically unchanged in ordinary crushers still being built and offered as modern equipment. The cross section at the right is typical of today's so-called modern or improved Blake type crusher. Note the same location of the hinge pin which causes severe rubbing between the jaws. Swing jaw, pitman and toggles all go up together just the same as they did in 1858. This severely unbalanced design makes low speed and low production unavoidable. Notice also the impossibility of lubricating this machine with all the heavily loaded parts unprotected from destructive rock dust. You cannot meet 1947 competition with 1858 designs.

*PRONOUNCED Q-KEN



561 CHESTNUT STREET OAKLAND 7, CALIFORNIA

STRAUB MFG. CO.

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyracone Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

A NEW 30-TON MACK



for Big-Load Quarry Work

• Introduction of Mack's new Model LRSW six-wheeler brings new standards of performance and capacity to the quarry field.

This big Mack packs its 30-ton payloads with unflinching ease over the toughest of terrain. There's abundant power in its 275 h.p. super-charged diesel engine. Extra ruggedness in its massive all-welded frame. Positive traction at all times because of its Balanced Bogie and exclusive Power Divider which effectively transfers power to wheels having the most traction.

Mack's Duplex transmission provides 8 forward

speeds in a single compact unit, with all ratios specially arranged for off-highway hauling. Safe and positive driving control is assured through such features as hydraulic power steering, air-assisted clutch, air-actuated brakes, easy turning radius and offset driver's seat.

All the way through Model LRSW is engineered for its own specialized job, built to move big yardage and do it profitably.

Find out how this new Mack dumper fits in with the demands of your quarrying job. Call or write your nearest Mack branch or dealer.



Mack

since 1900, America's hardest-working truck

Mack Trucks, Inc., Empire State Building, New York 1, New York.
Factories at Allentown, Pa.; Plainfield, N. J.;
New Brunswick, N. J.; Long Island City, N. Y. Factory
branches and dealers in all principal cities for service
and parts. In Canada, Mack Trucks of Canada, Ltd.

Trucks for every purpose



Ed. Sawyer caught off-guard at one of the sessions

Rail Rate Increase

(Continued from page 96)

diversion to water and truck haulage. The new rates will exceed by over 30 per cent the common sand rate as against the former 15 per cent differential. E. O. Schneider of Ottawa Silica Co., said that the industry has been singled out for bad treatment as rates are in many cases three or four times the cost of material.

JOHN M. PRICE, Campaign Chairman, Foundry Educational Foundation, explained the educational program initiated by the American Foundrymen's Association and other organizations to develop better technical personnel in the industry. Six colleges and universities are now participating in the program, including Northwestern University, University of Wisconsin, Case, Massachusetts Institute of Technology, and Cornell.

Workmen's Compensation Insurance

V. P. AHEARN, executive secretary, presented Ted Water's report on Workmen's Compensation Insurance Problems. Mr. Water's report referred to the New Jersey Industrial Hygiene Code pending consideration by the State Department of Labor. Several amendments were suggested by Theo. Hatch of the Industrial Hygiene Foundation, some of which were adopted in the redraft of the proposed code. Further recommendations will be made for changes in the redrafted code.

Workmen's compensation insurance rates in New Jersey were also touched upon by Mr. Waters. He pointed out that although there have been no claims for silicosis compensation against member companies, the rates continue at a very high level. The rate in 1945 was \$2.45 per \$100 of payroll, \$3.20 in 1946, and \$2.88 in 1947. The question of lowering these rates in conformance with experience of New Jersey producers was brought to the attention of the Compensation Rating and Insurance Bureau of New Jersey, and Mr. Waters is hopeful

that a substantial reduction will be made in the rate for 1948.

Mr. Waters reviewed the legislative developments covering workmen's compensation insurance, pointing out that one of the most important developments was the legislative amendments in New York State where the Escalator Clause for monetary liability was eliminated and claimants totally disabled from silicosis or asbestosis received the full benefits of the law for permanent disability or death. He also told about his conference with Dr. Wright of the Trudeau Sanitarium in the matter of a proposal to amend the New York law to make partial disability from silicosis compensable. Miss Mary Donlan, chief of the New York Workmen's Compensation Bureau has stated that it is her purpose to procure such an amendment. Dr. Wright is of the opinion that it is impossible to evaluate partial disability. The American Conference of Governmental Industrial Hygienists meeting in Buffalo appointed a committee to draft a uniform code with the recommendation that all States enact same. Mr. Ahearn pointed to the dangers involved in such legislation.

Committee Reports

Geo. Thornton presided at the final session on Friday. Stanton Walker reviewed the work of the Committee on Foundry Sand, including methods of test, grading and fineness. He told about the work in co-operation with the Testing Committee of the American Foundry Association, and the consideration being given to a secondary testing sand. Mr. Walker also reported on the progress of the Abrasive Blasting Manual. He said that it is proposed to send out a draft of the manual for the purpose of eliciting suggestions. It is hoped to have the report ready for the next meeting. Reporting for the Hygiene Committee, Mr. Walker said the committee is in a standby status. One problem, he said, has arisen in handling silica flour.

A. WARSAW, chairman of the Committee on Revision of the Constitution

and Bylaws, introduced his report which was adopted unanimously. V. P. Ahearn presented the report of the Committee on Finance which also was adopted.

Taft-Hartley Act

CHAS. A. HORSKY, prominent lawyer of Washington, D. C., and legal consultant of the association, gave a very concise, and clear analysis of the Taft-Hartley act and the historical background which led up to its enactment. Mr. Horsky said that the first change in the labor legislative picture was the Norris-LaGuardia act which limited injunctions. With the coming of the New Deal, the balance swung heavily in favor of the employees, starting with the NRA codes and the passage of the National Labor Relations Act. The Taft-Hartley act is an attempt to eliminate abuses and it also serves to bring into balance labor power with that of management. It still supports collective bargaining, it provides for a Conciliation Service, and a Fact Finding Board. Through the Attorney General, the President can issue an injunction for 60 days against a union. Mr. Horsky answered many questions, clarifying labor-management relations under the act.

Car Supply Problem

In a general discussion which followed, the car supply problem was indicated as becoming worse instead of better. One producer in the Cleveland area reported a 10-day delay in switching in his area. Producers in other areas reported similar conditions. It was suggested that railroad employees were engaged in a slowdown in retaliation for lay-offs of employees by the railroads as an economy measure.

Entertainment

Conventions of the National Industrial Sand Association are always well-attended by the wives of the members as the program is designed to provide entertainment throughout

(Continued on page 108)



Henry Thornton, V. P. Ahearn, and A. Y. Gregory in a huddle

The **SIDES** of a V-BELT

are what **GRIP** the **PULLEY**

-Naturally, it's the **SIDES**
that **GET** the **WEAR**

The story of what wears out a V-Belt—and how a belt can be built to withstand this wear a longer time — is quickly told. Here are the facts:—

Only the sides of a V-Belt touch the pulley. The sides do all the gripping on the pulley. The sides pick up the load. They transmit that load to the belt as a whole. Then, once again, the sides grip the driven pulley and deliver the power to it. And the sides take all the wear against the sheave-groove wall.

This explains why everyone who works around machines has always noticed that the sidewall of the ordinary V-belt is the part that wears out first!

**That's Why the Patented CONCAVE SIDE
That REDUCES Wear on Sidewalls is So IMPORTANT**

Naturally, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along

the middle of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belt can possibly give.

The Concave Side is MORE Important NOW Than Ever Before!

Now that Gates **SPECIALIZED** Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—up to 40% higher horsepower ratings in some cases—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally,

with heavier loading on the sidewall, the life-prolonging Concave Side is more important NOW than ever before!



THE GATES RUBBER COMPANY, DENVER, U. S. A.
"World's Largest Maker of V-Belts"

GATES VULCO ROPE DRIVES

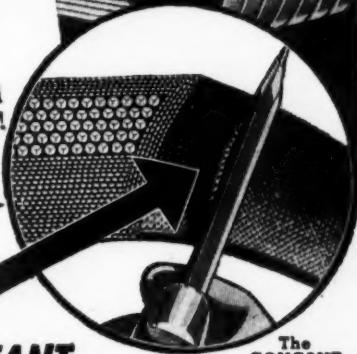
Engineering Offices
and Jobber Stocks

IN ALL INDUSTRIAL CENTERS

of the U. S. and
71 Foreign Countries



Diagram of V-Belt
in Sheave Groove

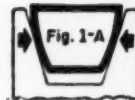


The
CONCAVE
SIDE
is a
GATES
PATENT

Straight Sided
V-Belt



How Straight Sided
V-Belt Bulges
When Bending
Around Its Pulley



You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with
Patented Concave
Sidewall



Showing How Con-
cave Side of Gates V-
Belt Straightens to
Make Perfect Fit in
Sheave Groove When
Belt Is Bending Over
Pulley.



No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

4711



The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
Established 1857
5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle

New FARREL-BACON CRUSHER

has many advantages

Design features of this 36 x 30 E stone crusher include: (1) Mechanite frame, sectionalized when necessary; (2) removable water cooled bearings; (3) improved design of swing jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive.

Write for further details or engineering help. 5A-1



FARREL-BACON
ANSONIA, CONNECTICUT

Missouri Limestone Producers Hold Meeting

MISSOURI LIMESTONE PRODUCERS held a special meeting in Columbia, Mo., on Thursday, September 18, for the primary purpose of making suggestions to the State P.M.A. Committee for the 1948 agricultural limestone contracts. This action was taken at the request of the State P.M.A. Committee and the following suggestions were made:

(1) State-wide contracts should be limited to areas which, after concentrated study, are inadequately served by county contractors. (2) Preference should be given to county contractors if they are proved to be adequate after careful scrutiny of past performance, financial stability, and capacity of equipment. (3) The State P.M.A. Committee is encouraged to cancel any contract after a producer has clearly shown he is not fulfilling and cannot fulfill his contracted responsibilities. (4) On request from the State P.M.A. Committee the Association will endeavor to furnish a policy committee of producers to assist the state committee in screening questionable contracts. (5) Each load of lime should be accompanied by a scale ticket. (6) Tonnage lines should be painted on all trucks to allow anyone a ready means of comparing the scale ticket with the volume of material. (7) County P.M.A. Committees are encouraged to increase their attention to enforcing accurate weights. Contracts and agreements with consistent violators should be withdrawn. (8) All loaded agricultural limestone trucks should have some type of satisfactory covering.

Missouri limestone producers have delivered about 70,000 tons more agricultural limestone to date this year than they had delivered by the same time last year, it was reported. Deliveries from January 1 to September 15, 1947, amounted to 1,233,043 tons as compared with 1,163,434 tons for the same period last year.

New Construction Increase

UNITED STATES Department of Commerce reported recently that the value of new construction put in place during the month of August was estimated at \$1,212,000,000, as compared with a revised figure for July of \$1,153,000,000. The August 1947, figure was nearly 15 per cent greater than the figure for August, 1946. During the first eight months of 1947 total new construction was estimated at \$7,721,000,000 as compared with \$5,862,000,000 during the same period of 1946. Private construction in August was estimated at \$909,000,000; private non-residential construction, \$266,000,000; and public construction approximately \$303,000,000.

California led all other states in total new construction activity as well as in private building in the first two quarters of 1947. Texas led in miles of new highway construction.



Dependable steel products and unequalled steel service facilities . . . available for your steel-buying convenience at twelve conveniently located Ryerson plants. Because of great demand, all sizes are not always in stock; but we usually can suggest a reasonable alternate.

PRINCIPAL PRODUCTS

Bars • Structural • Plates • Sheets
• Tubing • Allegheny Stainless • Alloy Steel • Safety Floor Plate • Bolts • Rivets • Metal Working Tools & Machinery, etc.

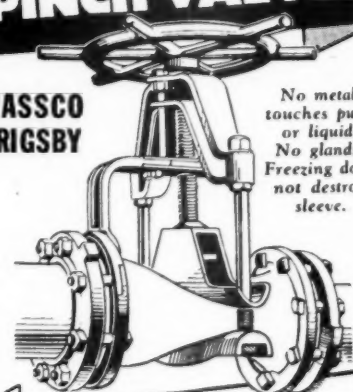
JOSEPH T. RYERSON & SON, Inc.

Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

PINCH VALVES

MASSCO GRIGSBY

No metal touches pulp or liquid. No glands. Freezing does not destroy sleeve.



NO METAL CONTACT

Successfully used for transporting abrasive and/or corrosive pulps and liquids . . . wherever severe wear makes replacement of metal type valves too costly. Collapsible sleeve of rubber or synthetic. Closes tight even on solid particles. No packing glands; not destroyed by freezing. Sizes: 1" to 12" dia.

THE MINE & SMELTER SUPPLY COMPANY

Denver Salt Lake City El Paso
1775 Broadway, New York

Jones

HERRINGBONE SPEED REDUCERS

Catalog No. 70 of Jones Herringbone Reducers presents a vast amount of data relating to Herringbone Reduction Units. Illustrations show a broad range of herringbone reducer applications, and technical information shows how to select reducers for all conditions of service in accordance with the A.G.M.A. recommended practice.

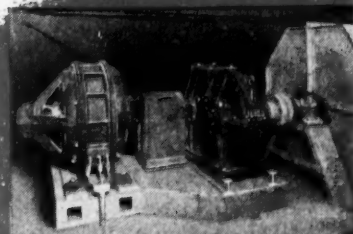
• This view of a Jones Triple Reduction Herringbone Speed Reducer typifies a line that is noted for advanced design, superior materials and precision workmanship.

JONES Herringbone Gear Speed Reducers are built in a wide range of ratios and ratings to cover every requirement. Single (Type SH) reducers in standard ratios range from 1.25 to 1 up to 11 to 1 in ratings from 1.3 to 440 H.P. Double (Type DH) reducers are built in standard ratios from 10.9 to 1 up to 72 to 1 in ratings from 0.5 to 275 H.P. The triple reduction reducers (Type TH) cover a range of ratios from 86.9 to 1 up to 355.8 to 1 in ratings from 0.3 to 78 H.P.

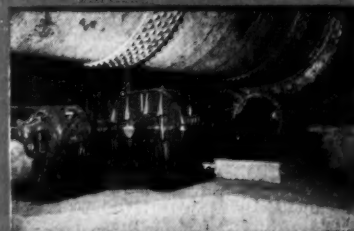
All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Cast Iron bases are available for all variations of motor assembly.

W. A. JONES FOUNDRY & MACHINE CO.

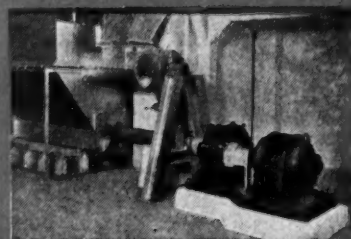
4447 Roosevelt Rd., Chicago 24, Ill.



• Jones Reducer on a cement mill elevator head shaft drive.

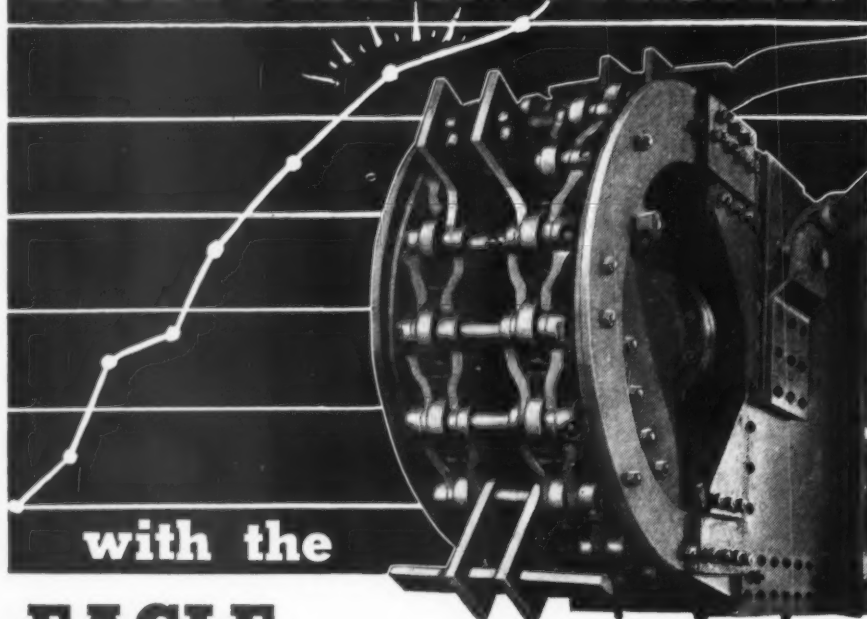


• Double type Jones Herringbone Speed Reducer driving kiln in cement plant.



• Jones Speed Reducer on a feeder drive in cement mill.

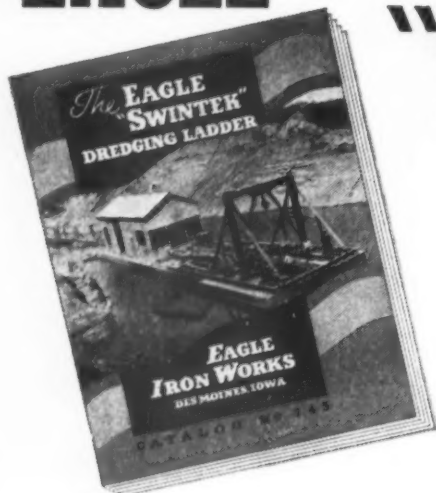
BOOST DREDGING PROFITS



with the

EAGLE

"SWINTEK"



- Cutters Assure Uniform Feeding . . . loosen and agitate deposit

- Chain Prevents Clogging . . . keeps oversize material out of nozzle; carries large chunks clear of suction area

Dredge deeper . . . dredge more
—the Eagle "Swintek" Dredging

Ladder assures regular flow of solids for the maximum number of working hours. Digging chain loosens, agitates compacted solids; screens out oversize pieces—no more "slug" pumping; no more shutdowns to clean out obstructions in nozzle opening or pipeline. Get at those usually coarser, deeper deposits—"Swintek" permits dredging below clay strata or boulder nests impeding plain suction pumping. Rugged, properly engineered design assures long service life, minimum maintenance. Digging chain of AMSCO austenitic manganese steel, "the toughest steel known," for maximum impact and abrasion resistance. Send for Bulletin 745 above.

EAGLE IRON WORKS
137 Holcomb Ave., Des Moines, Ia.

EAGLE Specialized Sand and Gravel Equipment
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS



EAGLE IRON WORKS
DES MOINES, IOWA
"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

Automatic Lime Kilns

(Continued from page 87)

small openings in the dividing wall between the tempering chamber and the calcining chamber. These openings are just below the ends of the tunnel beams which span the width of the calcining chamber. The hot gases are admitted under the beams in the two



One of two oil burners for firing kilns

top layers. The gases pass into the mass of stone through the exposed stone surfaces under the beams. They then pass up through the interstices of the stone which is slowly moving downward in a continuous and steady flow. The gases passing through the stone first calcine, then preheat, and finally are discharged into the hood of the chamber. From the hood chamber the gases are withdrawn by a No. 4 Sutorbilt exhaust fan.

As the stone moves down through the calcining chamber, that portion of it which is closest to the source of heat in passing the top layer of beams is farthest away from the heat when passing the second layer of beams. Because of this stirring action and as the firing is done at two separate horizontal series of points, all the stone, after passing both layers of firing beams, has been the same average distance from the source of heat and hence received approximately the same heat treatment.

Cooling air is drawn in through the discharge spouts and passes up through the downward-moving burned lime, cooling it to atmospheric temperature. Upon reaching the lower set of transverse beams, a regulated amount of this cooling air is drawn out into the cooling air header and to the main exhaust fan.

J. J. Connolly is superintendent of the Pacific Carbide & Alloy Co., and J. H. Jensen is chief engineer.

Statement of the Ownership, Management, Circulation, Etc., Required by the Acts of Congress of August 24, 1912, and March 3, 1933

Of ROCK PRODUCTS, published monthly at Chicago, Ill., for October 1, 1946.

State of Illinois, County of Cook, ss.
Before me, a notary public in and for the State and county aforesaid, personally appeared Stanley A. Phillips, who, having been duly sworn according to law, deposes and says that he is the Business Manager of ROCK PRODUCTS and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher — Maclean-Hunter Publishing Corp., 309 W. Jackson Blvd., Chicago 6, Ill.

Editor — Bror Nordberg, 309 W. Jackson Blvd., Chicago 6, Ill.

Managing Editor — Ralph S. Torgerson, 309 W. Jackson Blvd., Chicago 6, Ill.

Business Manager — Stanley A. Phillips, 309 W. Jackson Blvd., Chicago 6, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Maclean-Hunter Publishing Corporation, 309 W. Jackson Blvd., Chicago 6, Ill. The stockholders of the Maclean-Hunter Publishing Corporation are John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Ave., Evanston, Ill.; Col. J. B. Maclean, 7 Austin Terrace, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; The Maclean-Hunter Publishing Co., Ltd., 481 University Ave., Toronto, Ont., Canada.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and that this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or other wise, to paid subscribers during the twelve months preceding the date shown above is.....
(This information is required from daily publications only.)

Stanley A. Phillips,
Business Manager

Sworn to and subscribed before
me this 29th day of Sept., 1947.

[SEAL.]

M. E. Johnston
(My term expires October
22, 1949.)

FOR *Primary Crushing* GET A
"PENN-LEHIGH" AND YOU GET...



- High Tonnage Capacity
- Low Power Consumption
- Continuous Performance
Wet or Dry Materials

"Penn-Lehigh" Crushers are recommended for the primary reduction of cement rock, shales, phosphates, metalliferous ores, industrial minerals and limestones. They have extraordinarily high tonnage capacity at low power requirements, and capacity is not materially lessened by wet or frozen feed. They require little headroom, may be choke or continuously fed, feed materials freely, are continuous in operation. The numerous roll teeth "churn" materials in the hopper, minimize arching and packing and down-time from these causes. Capacities 200-1,000 tons hourly.

Like other "Pennsylvania" Crushers of various types "Penn-Lehighs" are massive, Steelbuilt, with large safety factors and exclusive safety devices—to minimize wear, damage and maintenance. Many other advantages.

Inquiries are invited and engineering services are freely available.

PENNSYLVANIA CRUSHER COMPANY

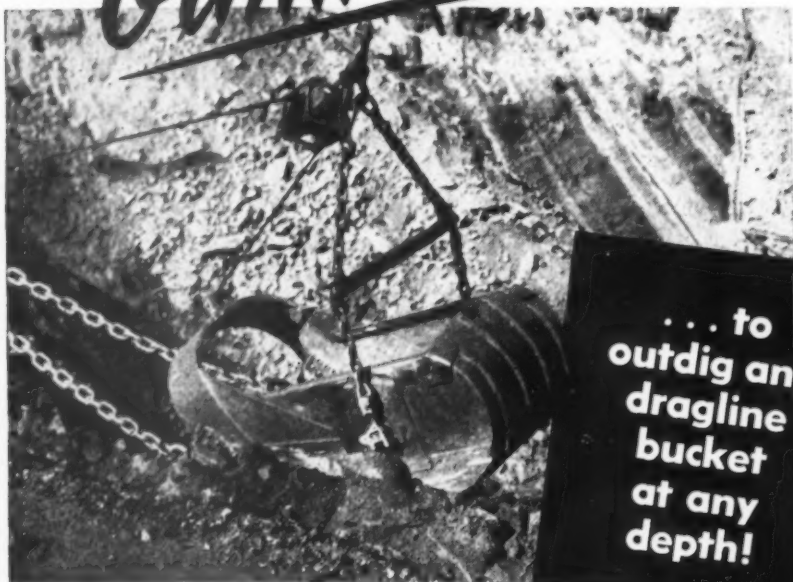
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When properly used Page AUTOMATIC
Buckets will outdig ordinary buckets of comparable size.

That's a guarantee you can easily prove for yourself by a competitive test. Compare the production of your present bucket with that of an AUTOMATIC. Hundreds of dragline operators in all kinds of digging have found that their AUTOMATIC buckets dig more yards at a lower cost per yard than any other dragline bucket they have ever used.

Here's why: Page AUTOMATICs dig right in at the first pull on the load line and get a full pay load within one to three bucket lengths regardless of the depth — 20 ft., 100 ft. or more. This means that most of your operations are under or near the end of the boom point where the minimum amount

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of power is required for hoisting the load. Perfect balance of the AUTOMATIC assures perfect control whether loading or dumping. Quick loading features of AUTOMATIC buckets mean less wear and maintenance on the bucket, cables and the dragline as well as minimum operator fatigue. For more complete details, see your own construction equipment distributor or write for new booklet "How to Get the Most Out of Your Page Automatic Dragline Bucket."

PAGE

DRAGLINE BUCKETS and
WALKING DRAGLINES



UNIVERSAL VIBRATING SCREENS

give best results

Hundreds of operators know the all-around efficiency and economy of the UNIVERSAL and profit by it! It will pay you to investigate this pioneer Vibrating Screen before you buy.

There's a UNIVERSAL to fit your particular requirements.

Write for Catalog No. 107 on
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Type
"MR"
42"x96"
Double
Deck

★ ★ ★ **UNIVERSAL VIBRATING SCREEN CO.** ★ ★ ★
RACINE - WISCONSIN

Deepest Limestone Mine

(Continued from page 79)

units: A screening plant where the kiln stone is sized and placed in bins for delivery by electric lorry to the chemical plant and where agricultural limestone is produced; a second screening plant superimposed over a Kern radial storage system; separate truck loading bins; and storage for kiln stone over a tunnel conveyor for later return to the main bins. The plant was designed by the Fred T. Kern Co. in cooperation with Columbia engineers and is very flexible in its ability to meet a number of specifications for commercial stone. Belt conveyors (30-in.) are used exclusively for intra-plant transportation and shipments can be made by rail, truck and, in the case of kiln stone, by electric lorry. Principal equipment comprises Allis-Chalmers vibrating screens, rubber belt conveyors, an Allis-Chalmers pulverator and Pennsylvania reversible hammer mill.

Stone is fed from the headframe bin by a Jeffrey electric vibrating feeder onto a belt conveyor, 200-ft. centers, that delivers the stone to screens over a 500 ton kiln stone storage bin. Kiln sizes are screened out over a 5- x 12-ft. double-deck screen, and 4- x 10-ft. single-deck screen and dropped into the bins. When these bins are full, Koehring Dumpsters transport the kiln stone to stockpiles for later reclamation over the tunnel belt conveyor.

There are two 4- x 10-ft. Ripl-flo screens and two 4- x 12-ft. screens of the same make in this plant, and an auxiliary agricultural limestone bin below. Normally two of these screens carry ½-in. and 8-mesh sq. openings on the top and bottom decks respectively; the others, 1-in. and 8-mesh screen openings. Minus 8-mesh fines are screened out immediately into the agricultural limestone bin.

Generally, minus 1-in. plus 8-mesh stone is diverted by chute to a belt conveyor and carried to the screening plant over the Kern radial storage system. Similarly, 8-mesh to ½-in. stone may be conveyed over the same belt for further screening and storage or be diverted to either pulverizer in the production of agricultural limestone. In that event, product of the pulverizers is closed-circuited with the screens by bucket elevator. All or part of the minus 1-in. stream of stone can be diverted to the pulverizers, which function as reduction crushers also, for the production of agstone or to increase the production of finer sizes of commercial stone.

The Kern plant provides for storage of six sizes of stone spouted from screens on the superstructure over the central hollow tower from which the bin compartment bulkheads radiate. Various sizes of stone are screened over two 4- x 10-ft. Ripl-flo double-deck vibrating screens and a 3- x 8-ft. Tyler Niagara screen. Typical sizes produced are ¼-¾-in. (Ohio

No. 9), $\frac{1}{2}$ - $\frac{3}{4}$ -in. (No. 6), $\frac{3}{4}$ - to $\frac{1}{2}$ -in. (No. 4), $1\frac{1}{2}$ - $\frac{3}{4}$ -in. (No. 3A).

Each ground storage compartment has free-flowing, live storage capacity of 250 tons and total ground storage is 200,000 tons. Bulldozers are used to handle stone from live storage to dead storage and reverse, and the same equipment handles kiln stone sizes over the reclaiming tunnel in the other plant unit. Any size of stone or any blend of stone sizes may be reclaimed through opening adjustable drawoff gates through which stone is drawn on to a loading out belt conveyor. The gates are opened from on top the circular tower by vertical rods. The load out conveyor transports stone at 50 t.p.h. back to the No. 1 screening plant for re-screening over a 5- x 14-ft. Ripl-flo double-deck vibrating screen, from which it is loaded into cars, placed into bins or transferred to a horizontal belt conveyor filling the truck-loading bins. Truck bin storage is 300 tons in six compartments.

One of the interesting features of the first screening plant is the control room by which the operator can handle by remote control all interlocked conveyors, screens and electrically-operated revolving chutes. A lighted master control board shows the flow of stone throughout the plant and the different routes through which the flow may be directed. In conjunction with the board are indicator lamps, push buttons and control switches for directing the flow of stone. In loading kiln stone into the lorry car for transport to the chemical plant, the chutes are gang-connected to operate electrically.

The present administrative and operating officials of the Limestone Products Department are as follows: H. B. Higgins, president, Pittsburgh Plate Glass Co.; E. T. Asplundh, vice-president, Chemical Division; D. W. Means, assistant vice-president, Chemical Division; R. L. Hutchison, general superintendent, Chemical Division; W. S. Straub, superintendent, Columbia Chemical Division; S. Forbes, chief engineer, Columbia Chemical Division; Bernard Manderfield, mine superintendent; L. T. Kaski, mine foreman; T. J. Lamberg, mine foreman; T. J. Pessonon, mine foreman; H. W. Crom, office manager; R. E. Petty, mining engineer; F. W. McKinnon, designing engineer; W. R. Flack, field engineer; R. Gottwalt, maintenance supervisor; and R. L. Callaghan, screening plant and sales supervisor.

Materials Handling Exhibit

THE SECOND NATIONAL Materials Handling Exposition will be held January 12-16 in Cleveland, Ohio, it has been announced. Among the many types of equipment to be exhibited will be hand trucks, lift trucks, conveyors, hoists, stacking units, tractors, fork trucks, and pallets. A conference and film on handling subjects will run concurrently with the show.



Long Life ...



Sure, it's a SECO

VIBRATING SCREEN

● Not only a long life, but an active one! That's the success story of Seco vibrating screens on all types of installations all over the country. Some have been on the job nearly ten years. Many have been given especially gruelling assignments meeting extra production requirements of the war just ended. Our files are filled with enthusiastic reports from operators who find that Seco's patented equalizer assembly pays off in more tons per hour... with less wear and tear on moving parts. The Seco pictured above has been in constant service for B. V. Hedrick, Lilesville, North Carolina, for eight years. Put a SECO to work on your job.

Write for "A Guide to Better Screening." Dept. B

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CIRCULAR
MOTION
VIBRATING
SCREENS

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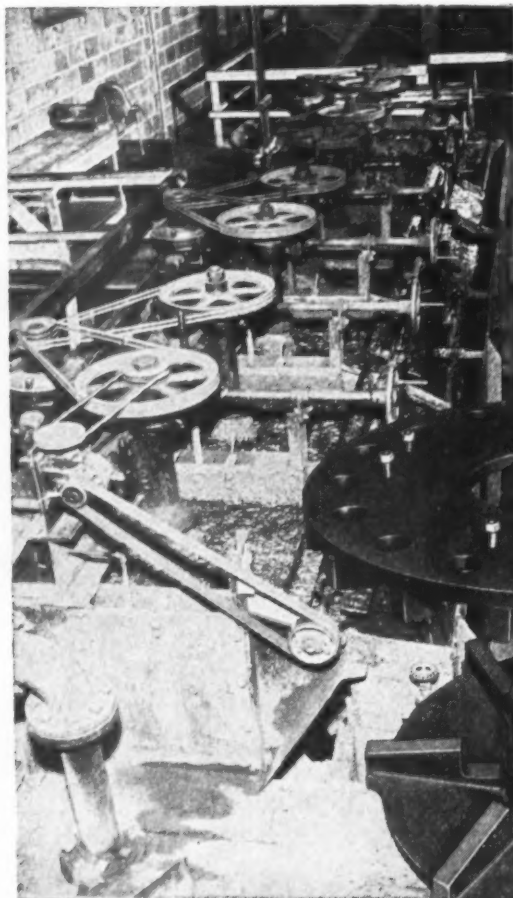
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PULVERIZERS

**Hundreds of Installations . . .
Use Bradley Pulverizers**

for the reduction of

**AGRICULTURAL LIMESTONE
Cement Materials and all
Dry, Non-Metallic Minerals**

**CAPACITIES: 1 TO 50 TONS PER HOUR
FINENESSES: 20 TO 350 MESH**

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

Industrial Sand

(Continued from page 100)

the convention. On each of the three evenings there was a cocktail party after which everyone retired to dinner as one big party. The "bachelors" congregated at one table. There were separate golf tournaments for the men and ladies, and for those who did not play golf on Friday, a trip to Biltmore House and Gardens. The meeting at Grove Park Inn brought back nostalgic memories to several, and particularly to Ted Matthews who spent his honey-moon here. Bill Woodward, Harry Hardy, and Lyle Manley also tried their luck at skeet shooting, but Bill thinks he will stick to trap shooting. Ed. Sawyer wandered up and was invited to take a shot, and got his bird with the first blast. Invited to try another, he agreed to rest on his laurels.

Some familiar faces were missed at the convention. The Campbells sent in their regrets, and so did the senior Farmers. Mr. Wolf again delighted the members with the showing of his colored moving picture film of convention happenings over the years, including the last Hot Springs meeting.

Registration

V. P. Ahearn, National Industrial Sand Association, Washington, D. C.; E. T. Andrews, Tavern Rock Sand Co., Mt. Union, Penn.

J. S. Coxe, Jr., Industrial Silica Corp., Youngstown, Ohio; Robert R. Coxe, Industrial Silica Corp., Youngstown, Ohio; Russell Cronenweth, Great Lakes Foundry Sand Co., Detroit, Mich.

S. E. Doster, Standard Sand Co., Benton Harbor, Mich.; E. M. Durstine, Keener Sand & Clay Co., Columbus, Ohio.

Sterling Farmer, Sand Products Corp., Cleveland, Ohio.

A. Y. Gregory, Whitehead Brothers Co., New York, N. Y.

C. M. Hardy, Hougland and Hardy, Evansville, Ind.; Harry P. Hardy, Hardy Sand Co., Evansville, Ind.; Tom H. Hardy, Hardy Sand Co., Evansville, Ind.; Russell G. Hay, Ayers Mineral Co., Zanesville, Ohio.

Lyle T. Manley, Manley Sand Co., Rockton, Ill.; T. C. Matthews, Pennsylvania Glass Sand Corp., Lewistown, Penn.; Alfred J. Miller, Whitehead Brothers Co., New York, N. Y.; Jesse T. Morie, Jesse S. Morie & Son, Vineland, N. J.; Robert W. Muhltner, Great Lakes Foundry Sand Co., Detroit, Mich.

William H. Patterson, Great Lakes Foundry Sand Co., Detroit, Mich.; Joel G. Pearson, Standard Sand Co., St. Joseph, Mich.; John F. Putnam, The National Silica Co., Oregon, Ill.

Charles G. Runkle, Ayers Mineral Co., Zanesville, Ohio.

E. C. Sawyer, Ayers Mineral Co., Zanesville, Ohio; Arthur B. Schlesinger, New Jersey Pulverizing Co., New York, N. Y.; E. O. Schneider, Ottawa Silica Co., Ottawa, Ill.; Junius M. Strouss, Deckers Creek Sand Co., Morgantown, W. Va.

Arnold H. Tanzer, New Jersey Pulverizing Co., New York, N. Y.; R. S. Torgerson, Rock Products, Chicago, Ill.; George A. Thornton, Ottawa Silica Co., Ottawa, Ill.; Henry C. Thornton, Ottawa Silica Co., Ottawa, Ill.; W. E. Trauffer, Pit and Quarry, Chicago, Ill.

Stanton Walker, National Industrial Sand Association, Washington, D. C.; A. Warsaw, Wedron Silica Co., Chicago, Ill.; C. R. Wolf, New Jersey Silica Sand Co., National Pulverizing Co., Millville, N. J.; Wm. H. Woodward, Ottawa Silica Co., Ottawa, Ill.; Marcus S. Wright, Jr., South River Sand Co., Old Bridge, N. J.

Guests

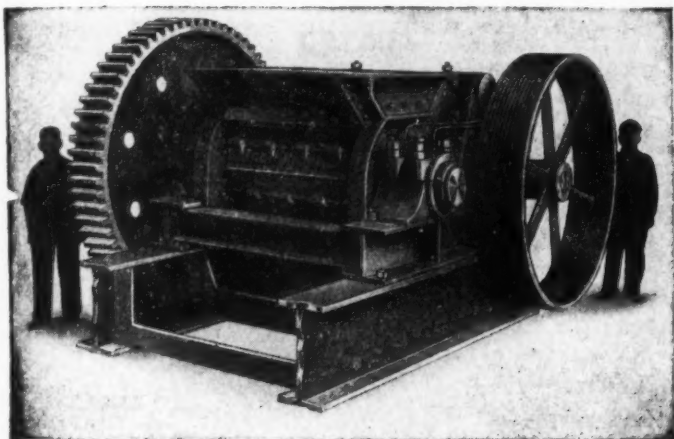
R. P. Burkman, St. Regis Paper Co., New York, N. Y.; William W. Collin, Jr., Pittsburgh, Penn.; C. H. Hartman, St. Regis Paper Co., New York, N. Y.; Charles A. Horsky, Washington, D. C.; R. E. Morey, Naval Research Laboratory, Washington, D. C.

Ladies

Mrs. R. P. Burkman, New York, N. Y.; Mrs. J. S. Coxe, Jr., Youngstown Ohio; Mrs. Rob-

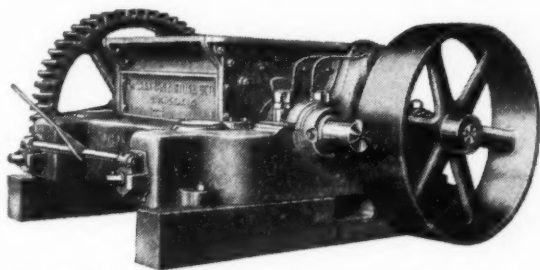
(Continued on page 110)

A DOZEN GOOD REASONS FOR CHOOSING McLANAHAN SINGLE ROLL ROCK CRUSHERS



**THE ROCKMASTER AUTOMATIC STEELSTRUT
TOGGLE PRIMARY CRUSHER—
REMARKABLE POWER AT LOW COST**

1. All Steel Constructed 2. Cast Steel Gears 3. Automatic Steelstrut Toggle for Tramp Iron Protection 4. Chilled Alloy Iron or Steel, Interchangeable and Reversible Crushing Plate Liners 5. Hard Surfaced Steel Segment Rolls Easily Replaced Without Dismantling Machine 6. Takes Choke Feed. 7. Dry, Muddy, Wet or Frozen Material Never Packs 8. Lowest Proportion of Flats and Dust Produced 9. Slowest Speed of Moving Crushing Elements 10. Greatest Crushing Range With Opening Easily Adjustable 11. Takes Large Primary Sizes 12. Low First Cost—Low Power Cost—Minimum Repair and Upkeep Costs.



**THE STEELSTRUT SLEDGE-WEDGE CRUSHER
HIGHEST TON-PER-DOLLAR VALUE!**

Modernize your present plant with modern, dependable, low cost McLanahan equipment. Write for descriptive Bulletins today.

McLANAHAN & STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters

Since 1835

HOLLIDAYSBURG, PENNSYLVANIA

**20% to 30% MORE FOOTAGE
with JAEGER MODEL 600**



600 cu. ft. of air per minute, delivered at standard engine speed, operates two big 4" drills at top efficiency, plus hand-held drill for secondary work.

Gives you the world's fastest drilling team on wheels, with a more portable compressor than your old 500 ft. machine.



Jaeger Model 600 "AIR PLUS" is powered with Murphy ME-66 Diesel, operating at 1225 r.p.m., and ruggedly but compactly designed to trail wherever big material trucks can travel. Built to micro-precision standards. With giant "ultra lapped" valves, 100% efficient air intercooling and automatic drainage, it delivers this air at 100 lbs. pressure within 100° of ambient temperature and with a minimum of moisture.

Other sizes: 60 to 500 ft. See your Jaeger distributor.

THE JAEGER MACHINE CO.

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REGIONAL OFFICES

8 E. 48th St. 226 N. La Salle St. American Life Bldg.
New York 17, N. Y. Chicago 1, Ill. Birmingham 1, Ala.

AIR COMPRESSORS, MIXERS, PUMPS, HOISTS, PAVING
MACHINERY, TRUCK MIXERS — DISTRIBUTORS IN 128 CITIES

TRY THE Walnut Test!



See why the impact action of a
NEW HOLLAND 3030 BREAKER
will increase your profits



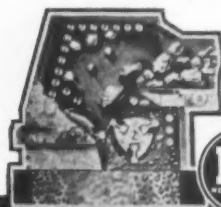
1 Whirl a walnut tied on a piece of string against a wall or table. The impact breaks it with little effort . . . into comparatively uniform pieces because the breaking force is evenly distributed.

2 Now crush a walnut with a pair of pliers. The middle section of the nut is pulverized . . . yet the ends remain in large, irregular pieces. Crushing force is confined to one small area . . . much greater effort succeeds only in producing an undesirable product.



Using the same suspended *impact* action as illustrated by the walnut on a string, a New Holland 3030 Breaker can reduce 30" rock to 7/8" or finer in *one operation* . . . producing a uniform, cubical aggregate. That means bigger profits because of less waste fines . . . less power used. Write for the illustrated booklet describing the Model 3030 Breaker in detail.

NEW HOLLAND MANUFACTURING CO.
Mountville, Pennsylvania



Ask your distributor to show you "The New Stone Age," a color film of the 3030 Breaker in action.

NEW HOLLAND
DOUBLE IMPELLER BREAKERS

(Continued from page 108)

ert R. Coxey, Youngstown, Ohio; Mrs. Russell Cronenweth, Detroit, Mich.; Mrs. S. E. Doster, Benton Harbor, Mich.; Mrs. E. M. Durstine, Columbus, Ohio; Mrs. Sterling Farmer, Cleveland, Ohio; Mrs. A. Y. Gregory, New York, N. Y.; Mrs. C. M. Hardy, Evansville, Ind.; Mrs. Tom H. Hardy, Evansville, Ind.; Mrs. C. H. Hartman, New York, N. Y.; Mrs. Russell G. Hay, Zanesville, Ohio; Mrs. Lyle T. Manley, Rockton, Ill.; Mrs. Alfred J. Miller, New York, N. Y.; Mrs. Jesse T. Morie, Vine-land, N. J.; Mrs. Robert W. Muhltner, De- troit, Mich.; Mrs. William H. Patterson, De- troit, Mich.; Mrs. Joel G. Pearson, St. Joseph, Mich.; Mrs. John F. Putnam, Oregon, Ill.; Mrs. Charles G. Runkle, Zanesville, Ohio; Mrs. E. C. Sawyer, Zanesville, Ohio; Mrs. Junius M. Strauss, Morgantown, W. Va.; Mrs. George A. Thornton, Ottawa, Ill.; Mrs. Henry C. Thornton, Ottawa, Ill.; Mrs. A. Warsaw, Chi- cago, Ill.; Mrs. C. R. Wolf, Millville, N. J.

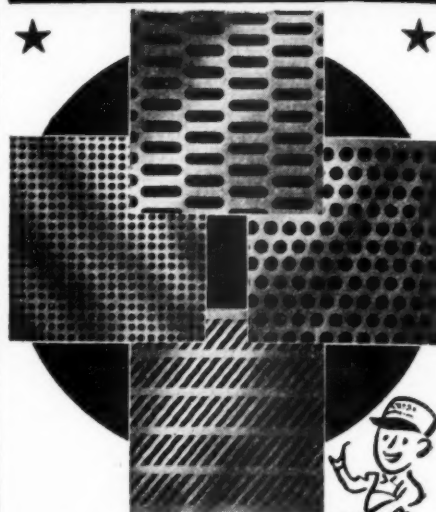
Rock Dike to Change Missouri Channel

ST. CHARLES ROCK QUARRY, St. Charles, Mo., has been awarded the contract to furnish stone for the relo- cation of the Missouri river at the point where it passes this town. The relocation will move the river about 1000 ft. to an old channel at that point. United States Engineer Corps is in charge of the operation.

Start Quarry Operation

GEORGE K. MELVIN and Walter Stoebener recently began operation of a new quarry near Baldwin City, Kan., for the production of crushed rock to be used in the resurfacing of highway 50N. The plant is operated 24-hr. per day. It is expected to pro- duce 100,000 tons of stone in 60 days.

YOU CAN DEPEND ON
MAXIMUM SCREENING
EFFICIENCY with
HARRINGTON & KING
PERFORATED METAL

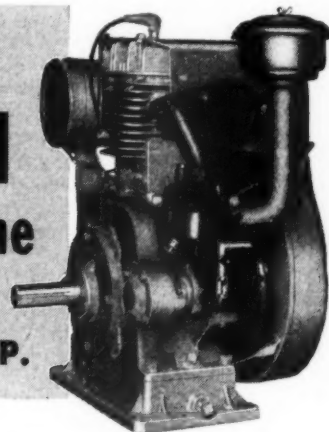


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and Prices

The Harrington & King
PERFORATING CO.

5650 FILLMORE ST., CHICAGO 44, ILLINOIS
114 LIBERTY ST., NEW YORK 6, N. Y.

This **HEAVY-DUTY**
WISCONSIN
Air-Cooled-Engine
IS AVAILABLE IN 4
SIZES . . . 4 TO 9 H. P.



Illustrated above is the Models AEH to AHH series of 4-cycle single cylinder Wis- consin Air-Cooled Standard Engines, to which the following specifications apply:

MODEL	AEH	AFH	AGH	AHH
Bore	3"	3 1/4"	3 1/2"	3 3/4"
Stroke	3 1/4"	4"	4 1/4"	4 1/2"
Cu. in. Displ.	23	33.2	38.5	41.3
Hp. Range	4-6	5-7	6-8.5	7-9
Weight	130 lbs.	180 lbs.	180 lbs.	180 lbs.

If your equipment calls for an engine within the above power range, it will pay you to give serious consideration to the Wisconsin line . . . noted for rugged, heavy-duty serviceability and thorough-going dependability.

In addition to the engines listed above Wisconsin 4-cycle single cylinder engines are also available in 2 to 4 hp. sizes, and V-type 4-cylinder engines can be sup- plied in a power range of 13 to 30 hp. Detailed data furnished on request.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

Manufacturers' News

James F. Lincoln Arc Welding Foundation, Cleveland, Ohio, has named Professor R. S. Green, Department of Industrial Engineering, Ohio State University, as editor-in-chief of the Foundation's new book "Design for Welding."

R. G. LeTourneau, Inc., Peoria, Ill., has announced the appointment of L. A. Welch as executive vice-president. During the war Mr. Welch was deputy



Elmer E. Isgren



L. A. Welch

director in charge of field production for the War Production Board. He also served as regional director of the W.P.B. in Detroit. Elmer E. Isgren has been named vice-president in charge of production. Mr. Isgren is also a director of the LeTourneau Corp. and manager of the Longview, Texas, plant. The company has also announced the opening of a divisional office at 5007 E. Washington Blvd., Los Angeles, Calif.

Link-Belt Co., Chicago, Ill., has announced the appointment of James B. Elliott as divisional sales manager at the Minneapolis, Minn., plant. Erwin A. Wendell will succeed Mr. Elliott as divisional sales manager at the Caldwell plant in Chicago, and T. W. Matchett, formerly district sales engineer at New York, has been named district sales manager of the Chicago branch, with headquarters at the Pershing Road plant, replacing Mr. Wendell.

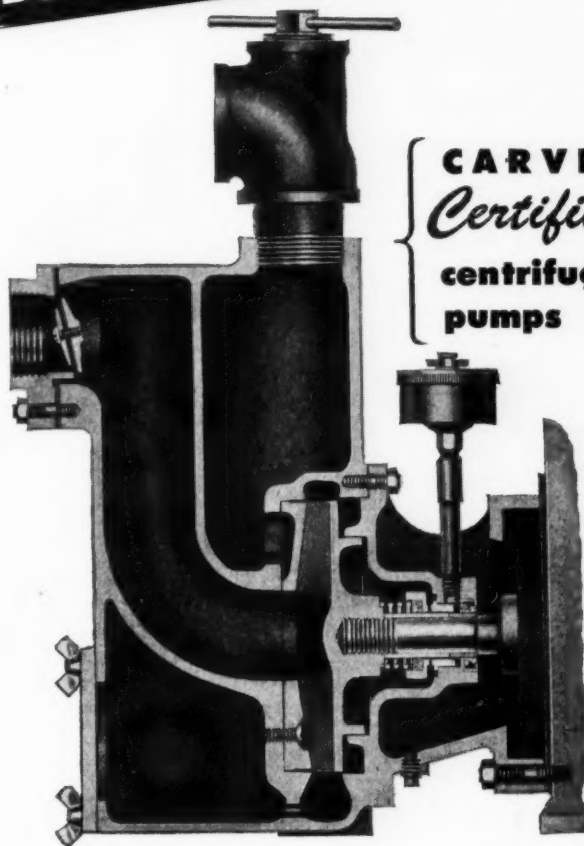
Lincoln Electric Co., Cleveland, Ohio, has appointed A. F. Boucher as district manager of the Milwaukee office. He was formerly welding engineer handling special accounts in the Detroit area. Marshall Ford, welding engineer in the Pittsburgh district, has been made district manager of the Minneapolis office.

International Paper Co., New York, N. Y., is planning a construction program for 1948 and 1949 involving the expenditure of \$25,000,000 in the United States.

Bemis Bro. Bag. Co., St. Louis, Mo., has signed a contract for the immediate construction of a plant at Vancouver, Wash., for the manufacture of multiwall paper shipping sacks. Contract was awarded to Ross B. Hammond Co., Portland, Ore.

Milwaukee Hydraulics Corp., Milwaukee, Wis., has announced the appointment of W. G. Beriswill as assistant sales manager.

Here's the Inside Story of Better Pumping Performance



CARVER
Certified
**centrifugal
pumps**

- ★ High Capacity at high suction lift.
- ★ High Efficiency at high pressures and at slow speeds.
- ★ Non-Recirculating—no priming gadgets.
- ★ Life-Time Seal — wearing surfaces are almost diamond-hard.
- ★ Fewer Working Parts because of simple design.
- ★ Non-Clogging — streamlined design.
- ★ Performance of each pump is certified.

**Capacities from
3000 to 200,000
GPH. Sizes 1½"
to 10". Ask for
Bulletin 101-A.
Carver Pump Co.,
Muscatine, Iowa.**

CARVER PUMPS

*Muscatine
Iowa*

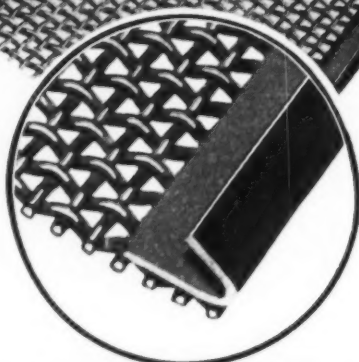
NO SAG NO PULL OUT

With Cleveland Wire Screen Section Assemblies

• Increase your profits and stop tonnage losses with the specially prepared, reinforced screen sections for vibrators. This standard type of edge is available in five different styles for electrical and mechanical vibrating machines.

Let our wire screen specialist show you how you can adapt these screen section assemblies to increase your profits.

There is a CLEVELAND Wire Screen for every purpose.

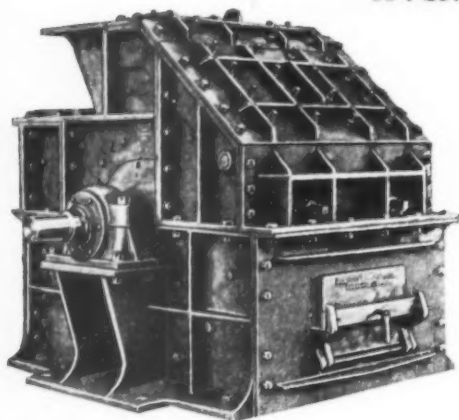


- NO PULL-OUT
- NO SAG
- LONGER SCREEN LIFE
- EXTRA STRENGTH
- EASY TO CHANGE
- DRUM-TIGHT TENSION

For detailed information on Cleveland Screen Section Assemblies write today for BULLETIN No. 6.

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 78 STREET CLEVELAND 5, OHIO

TO KEEP UP WITH TODAY'S INCREASED DEMANDS



The "ACS" Crusher can be furnished with conventional front feed for minimum fines or with center feed for producing a finer product containing a maximum amount of fines. Hopper opening is centered over rotor, and material falls well back on rotor, subjecting the material to longer travel in hammer cycle.

- High tonnage for large scale production
- Massive for heavy duty operation
- Center-feed for increased small sizes

Present day conditions and high production demands call for a flexible, sturdy crusher that can withstand severe, continuous service with complete dependability and low operating cost.

The American "ACS" Crusher is especially designed and constructed for high capacity and produces uniform road-stone, aggregate, and agstone without slivers or finger stones. Capacities up to 250 TPH.

Send for latest data and specifications

American

PULVERIZER COMPANY

Originators and Manufacturers of
Ring Crushers and Pulverizers

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ST. LOUIS, 10, MO.

Chase Bag Co., Chicago, Ill., has appointed R. J. Stevens as sales manager of the Buffalo branch. The Dallas branch has been awarded a Certificate of Merit in recognition of its outstanding safety record.

Lima Locomotive Works, Lima, Ohio, has announced the appointment of Fred L. Maus as district manager for the shovel and crane division at Memphis, Tenn., to fill the vacancy



Fred L. Maus



R. A. Otterness

left by the death of G. L. Lillard. Mr. Maus will cover the States of Tennessee, North and South Carolina, Georgia, Florida, Alabama, Louisiana, and Arkansas. R. A. Otterness of Spokane, Wash., former sales representative in the southwestern and northwestern territory, has been appointed to succeed Mr. Maus at Dallas as district manager covering the States of Texas, New Mexico, Colorado and Oklahoma. Announcement has also been made that Wilhelm-Davies Co., Inc., Wallingford, Conn., has been appointed sales agent in the State of Connecticut.

United States Rubber Co., New York, N. Y., has appointed H. Barden Allison as sales manager of the Gilmer division in Philadelphia. Ralph W. Stambaugh has succeeded Mr. Allison as district sales manager of mechanical goods in Cincinnati, Ohio. Purdy Miller has been appointed district sales manager in Indianapolis, and will be succeeded by N. W. Swenson as district sales manager in Buffalo. Paul S. Bigby, assistant district sales manager at Detroit, will go to Milwaukee, Wis., as district sales manager.

St. Regis Paper Co., New York, N. Y., has acquired the right to manage and utilize 208,000 acres of long leaf and slash pine in the Suwannee Forest in Georgia.

Bigelow-Liptak Corp., Detroit, Mich., announces that Braxton Pollard has been made advertising and sales promotion manager. He was formerly advertising manager for A. B. Green Fire Brick Co.

Hardinge Co., Inc., York, Penn., will display a "Thermomill," rotary dryer and conical ball mill at the Exposition of Chemical Industries, New York, N. Y., December 1 to 6, also a constant-weight feeder.

John A. Roebling's Sons Co., Trenton, N. J., announces the appointment of H. S. Christie as manager of the Atlanta, Ga., branch office. He replaces C. G. Mullings who retired recently after 45 years of service in the Atlanta territory.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named G. Edward Conn, Jr., as manager of the new branch office at York, Penn. MacGregor G. Jones, former representative at the Harrisburg office, which has been discontinued, will assist Mr. Conn at York as sales representative.

The Dorr Co., New York, N. Y., recently celebrated the 30th anniversary of the acquisition of the Westport mill, research and testing plant at Westport, Conn., with John V. N. Dorr acting as host.

Elwell-Parker Electric Co., Cleveland, Ohio, has placed Nelson J. Leonard in charge of the trucks, tractors and cranes account for the Colby Steel & Engineering Co., Seattle, Wash.

Harbison-Walker Refractories Co., Pittsburgh, Penn., has appointed Charles W. Gerster as general manager of the Louthan Manufacturing Co., East Liverpool, Ohio, recently purchased by the company.

American Brake Shoe Co., New York, N. Y., has appointed Charles S. Sliter as assistant general sales manager for the Kellogg Division, with headquarters in Rochester, N. Y. He was formerly sales promotion manager and will continue to direct promotional and advertising activities of the division.

The W. W. Sly Mfg. Co., Cleveland, Ohio, has announced the election of Frank W. Klatt, general manager, as president of the company to succeed S. C. Vessy who died in 1946.

LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, has named A. W. Schmidt as advertising manager to succeed H. K. Kenyon. Mr. Schmidt was formerly manager of sales and service training. He joined the company in 1930 as blueprint boy in the engineering department and later transferred to the parts and service department, machine order bureau and general sales.



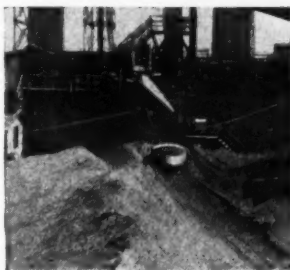
A. W. Schmidt

Mack Trucks, Inc., New York, N. Y., announces the appointment of John G. Caley as manager of the National Accounts Department for the Southern division, with headquarters in Atlanta, Ga.

B. F. Goodrich Co., Akron, Ohio, has appointed Carmen F. Newland as manager of the Kansas City district of the industrial products sales division.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div., New York, N. Y., announces the appointment of J. S. Eskin as general manager of sales of the Realock fence division and subsidiaries, with headquarters in Buffalo, N. Y. L. J. Renner has been named district sales manager, Chicago, Ill., succeeding T. H. McSheehy who has retired.

SLASH COSTS with Sauerman Machines



ECONOMICAL STOCKPILING

Picture shows how one-man Sauerman Scraper handles a 25,000-ton pile of phosphate rock at Florida drying plant. Operation is changed quickly from storing to reclaiming.



DEEP PIT DIGGING

This Sauerman Slackline Cableway is moving gravel from a wet pit 90 ft. deep, delivering direct to screens at cost of few cents a cubic yard.

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- (1) Digging, hauling and automatic dumping are merged into a continuous rapid operation controlled by one operator.
- (2) Power requirement is moderate.
- (3) Maintenance is simple.

Sauerman machines offer handling capacities from 10 to 1,000 tons per hour and operating spans from 200 to 1500 ft. Specifications of the various sizes and types of machines, together with illustrations of their uses are given in the Sauerman catalogs. Write for this literature today.

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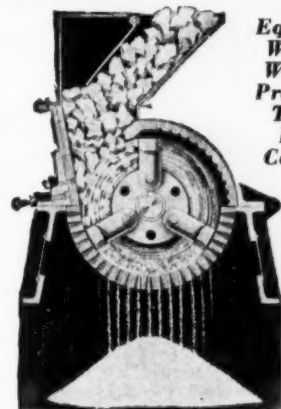
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Built in a size range from 3 tons per hour to 75 and 100 tons per hour. Larger sizes for primary and secondary work.



Equipped With or Without Protective Tramp Metal Catchers

Cut-a-way view of Gruendler Pulverizer

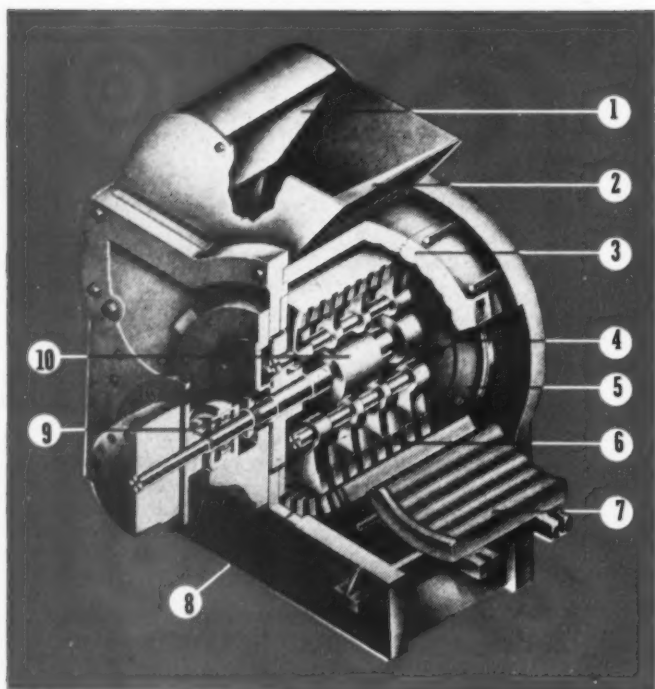
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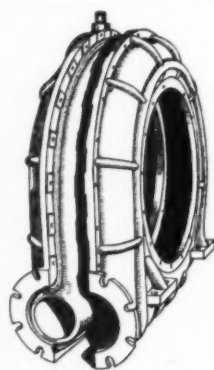


10 reasons why - - - YOU CAN'T GO WRONG IN A DAY PULVERIZER-CRUSHER

- 1 **SAFE**—Hinged baffle plate in hopper prevents material from "kicking back."
- 2 **QUICK FEED**—Steep angle of hopper feed plate induces fast and uniform feeding of material, thus resulting in fast and uniform reduction.
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- 4 **TAKE-UP HOLES**—Hammer flanges have two extra sets of graduated step-out holes so that hammers may be set out as they wear on the end.
- 5 **MANGANESE STEEL SIDE LINERS**—Renewable and interchangeable.
- 6 **REVERSIBLE SWING HAMMERS**—Interchangeable . . . made of high grade manganese steel. Three extra-heavy U-shaped, one-piece hammers used . . . free-swinging on sturdy alloy steel rods.
- 7 **EASY ACCESS**—The patented hinged doors provide easy access to the inside of the DAY pulverizer for reversing screen bars, changing the spacing, or reversing and lowering the hammers.
- 8 **REVERSIBLE SCREEN BARS**—Made of thick high grade carbon tool steel.
- 9 **SKF ROLLER BEARINGS**—Double row, extra heavy duty, self-aligning roller bearings in dust-tight leak-proof housings assure trouble-free, dependable performance.
- 10 **REVERSIBLE ROTOR**—All-steel rotor assembly may be reversed so that pulley can be operated from either side of the DAY pulverizer.

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THAT NEVER WEARS OUT!**

"Tell-Tale" Centrifugal
Sand and Gravel Pumps have vertically split Shells enclosing renewable Liners. Due to patented construction no wear ever takes place on the Pump Shells.

Other features: Renewable Face Plate Liners; Ball Thrust Bearings; screwed, adjustable Impellers.

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Handle Large Volumes Quickly

For high-speed unloading . . . both bucket type and drag chain type for stone, gravel, chips, stoker and nut coal, etc. Spiral screw conveyor for cement, powdered lime, or any material that becomes fluent in movement.

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Self-unloading . . . also spreads lime and phosphate, delivers coal into bins, transfers loads . . . many other specialized services.
WRITE for complete information.



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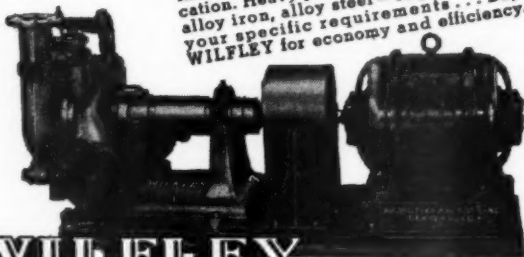
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WON'T QUIT
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A Hayward Bucket keeps the job
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CONCRETE PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

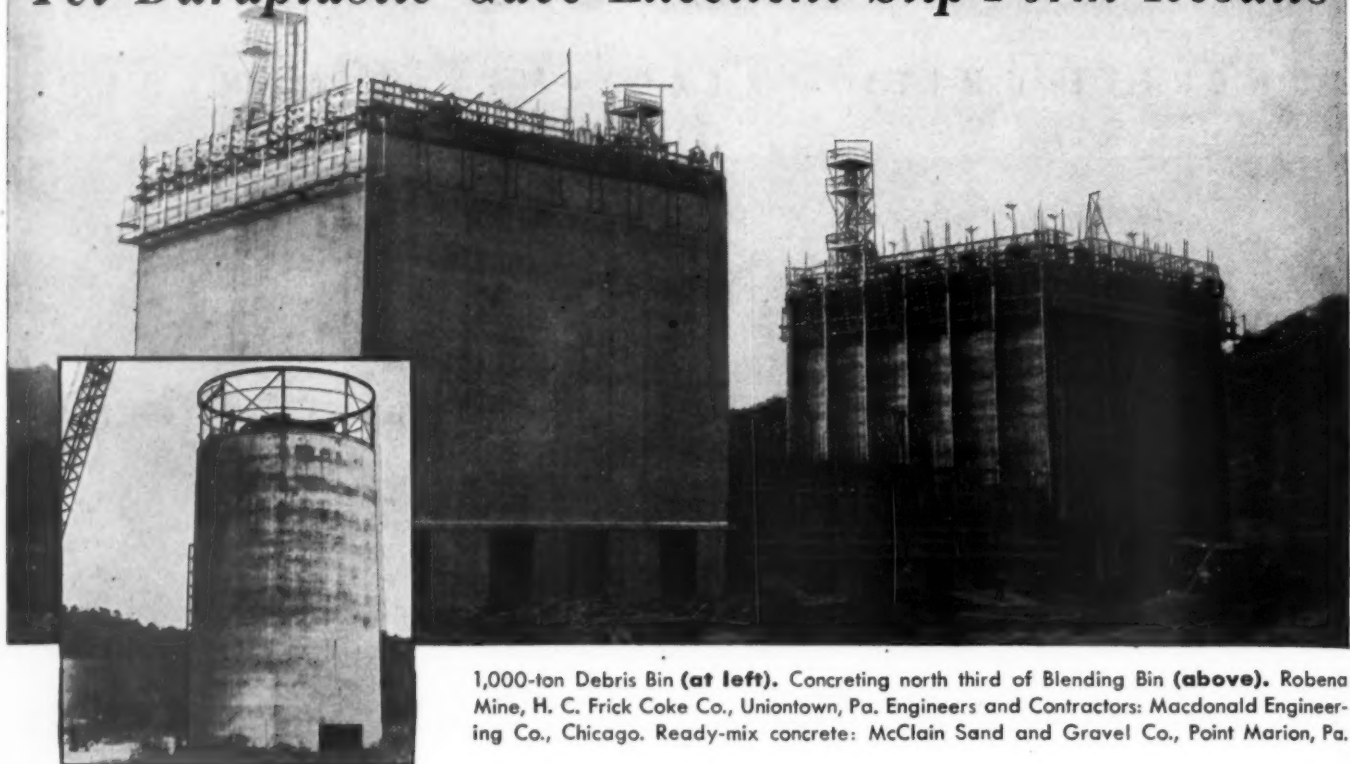


• Cemenstone Corporation plant for the manufacture of large precast concrete sections. Steam kilns shown to the rear

A SECTION OF
ROCK PRODUCTS

Conditions Unfavorable...

Yet Duraplastic Gave Excellent Slip-Form Results



1,000-ton Debris Bin (at left). Concreting north third of Blending Bin (above). Robena Mine, H. C. Frick Coke Co., Uniontown, Pa. Engineers and Contractors: Macdonald Engineering Co., Chicago. Ready-mix concrete: McClain Sand and Gravel Co., Point Marion, Pa.

The weather did its best to make the job difficult. It rained frequently. Temperatures varied from 35° to very warm. Besides, much of the help was inexperienced.

In spite of these unfavorable circumstances, slip-form work on the Debris Bin progressed rapidly and smoothly. Because of the superior workability of Atlas Duraplastic concrete, contractor recommended and owner approved its use also for the 18,000-ton Blending Bin. Report showed: excellent-looking concrete with no honeycomb... good workability of concrete permitted placing around heavy reinforcing with less spading.

For slip-forms, as well as for other methods of construction, Duraplastic makes concrete more workable, more plastic and more uniform throughout. It provides the proper amount of entrained air needed for satisfactory field performance and complies with ASTM and Federal Specifications. It sells at the same price as regular cement.

Send for further information. Write Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Cleveland, Dayton, Des Moines, Duluth, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

CP-D-15

ATLAS DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

TRADE MARK REG.
U. A. C. CO.



"THE THEATRE GUILD ON THE AIR"—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—ABC Network

INDUSTRY NEWS

BAXTER CEMENT Products Co., Baxter Springs, Kan., plans to expand its plant and services to include building repair, installation work, and related fields. The plant has been working at capacity supplying materials for a number of large projects in the Tri-State area.

WILLIAM SCHWINCK has announced plans to construct a cement block plant at West Point, Neb. A block machine with a capacity of 240 block per hour already has been ordered.

OTTAWA TILE & BRICK Co., Ottawa, Ohio, has started the production of drain tile and concrete block at the plant of the Arlington Builders Supply Co. C. C. Hornung is superintendent of the Ottawa plant and Rick Hornung is in charge at Arlington.

NORTHWEST MATERIALS, INC., Bryan, Ohio, has started the manufacture of transit-mixed and plant-mixed concrete.

MASOLITE Co., a division of the General Dredging Co., Fort Wayne, Ind., is now producing concrete brick and block and Masolite block at its new plant. At full capacity, 25,000 bricks and 5,000 building block will be turned out per 8 hour day using a Besser Vibrapac machine. Ralph Walb is general manager of both the Dredging Co. and the concrete plant.

ELMER KIELINEN AND RONALD KESKEY have opened a concrete block plant at Ishpeming, Mich., with a present production of 1,000 block per day. The firm expects to have an output of 2,500 to 3,000 block per day by spring.

WISHEK CONCRETE PRODUCTS AND LUMBER Co., Wishek, Minn., is now making concrete building block at a rate of 2,000 per day with Leopold Rudolf in charge.

EUGENE SAND & GRAVEL Co., Eugene, Ore., has purchased the Jorgensen's Ready-Mix Concrete Co. in Eugene and Springfield at a cost of approximately \$125,000. L. H. Williams, co-partner in the purchasing firm, said the company will furnish concrete to contractors Nels T. Jorgensen, former owner of the concrete plant, has retired.

CONTACT SUPPLY CORP., Fitchburg, Mass., has incorporated to manufacture, buy and sell brick, stone, cement and building materials. Common stock has been listed at 500 shares, Class A, no par value, and 250 shares, Class B, no par value. Corporation officials are: Raymond Morse, president; Miss Marguerite L. Fitzgerald, treasurer; and Harry D. Penan, clerk.

WHITNEY READY-MIXED CONCRETE Co., Duluth, Minn., has issued a profusely illustrated booklet showing the part played by concrete in the beautifying and building of the City of Duluth, and describing the company's facilities for supplying a high-quality product. The company has been in business in Duluth for 15 years.

MILFORD CONCRETE PRODUCTS, INC., Milford, Mass., has been incorporated with an amount of \$30,000 paid in property. Officers and directors are: William Honek, president; Charles Honek, treasurer and secretary, and Dorothy Honek.

VIBRA CONCRETE PRODUCTS, INC., Farmington, Mass., has been incorporated for \$1500. Officers and directors are: Daniel P. Clancy, president; Joseph P. Saltas, vice-president; and Walter D. Aston, treasurer and secretary.

ERNEST ROTHFELDER, College of Emporia student, has started the manufacture of concrete block 4- x 8- x 12-in. at Emporia, Kan. The new type block also are grooved for the employment of reinforcing steel, and are being turned out at the rate of 1,000 per day.

GREER CONCRETE AND BLOCK Co., Greer, S. C., will soon begin the manufacture of concrete block at the rate of 3,500 per day. Construction of a building to house the new industry is underway, which together with machinery to be purchased, will represent an investment of \$35,000.

HALCRETE PRODUCTS Co., Wichita Falls, Texas., has begun production of lightweight block in its new plant. Haydite is used exclusively as aggregate in all block made by this new company. H. E. Dugan, founder and president, states that Texas is becoming increasingly aware of the advantages inherent in sawable, nailable lightweight block.

RED WING READY MIXED Concrete Co., Red Wing, Minn., has started operation of a new plant located adjacent to the Thompson Material Co. sand and gravel pit. The pit has also been revamped and much new machinery has been added. Transit mixers are used for concrete delivery.

C. P. ARMSTRONG, a concrete contractor in Waverly, Ohio, since the war, has formed a partnership with his father and a brother (Pearl and Charles Armstrong) for the manufacture of sand and gravel as well as cinder block. The new company has rented quarters and installation of equipment is almost completed. Prior to this new venture, the elder Mr. Armstrong was engaged in block manufacture and the construction business for 30 years.

HUGH PFLEIDERER has purchased the interest of K. C. Wagner in the Tiro Concrete Block Co., Tiro, Ohio. The partners started operation of the block plant early in 1947.

O'FALLON CONCRETE PRODUCTS Co., O'Fallon, Ill., formerly owned by Edwin Ahle, has been sold to Elmer Feltman and Russell Schaefer.

RICHARD TYRHOLM AND THORNTON CRUMB, veterans, have started construction of a concrete block plant at New Richland, Minn.

BREMERTON CONCRETE PRODUCTS Co., Bremerton, Wash., has installed a new Besser Vibrapac block machine and the capacity of the plant has been increased to 20,000 units per day. The plant is also equipped to produce coping tile and steel sash, drain tile, sewer pipe, culvert and well curbing. James Sullivan is manager of the plant.

COGLEY READY-MIX Co., Council Bluffs, Iowa, has been incorporated, with an authorized capital stock of \$50,000, to deal in the manufacture, sale and delivery of ready mixed concrete, sand, gravel, and similar construction materials. J. E. Quinn is president of the board.

SUPERIOR CONCRETE PRODUCTS Co., Pine Bluff, Ark., is the name of a new concrete block plant built by R. A. Wilson which will manufacture 33 different designs of concrete block.

HATTING CONCRETE BLOCK & TILE Co., Uverne, Minn., has started the manufacture of concrete block and tile.

CARLSON CONSTRUCTION Co., Essex, Iowa, operated by Walter Carlson and son, Ronald, has established a ready mixed concrete plant in Shenandoah to be operated in connection with the construction business. The new plant will be known as the Ready-Mix Concrete Co., and will have a capacity of 120 cu. yd. of finished concrete per day.

ST. FRANCIS BLOCK & TILE Co., LTD., Sherbrooke, Quebec, Canada, under the partnership of William Lavalley, James Smith and A. E. Wright, has started the production of concrete block, with plans being made to produce concrete brick and tile at a later date.

CONCRETE PRODUCTS CORP., Humboldt, Iowa, has installed new equipment to handle aggregate and mix concrete for both the ready mix department and the manufacture of concrete pipe. Don C. Pierson is president of the corporation.

MIDWEST BRIKCRETE Co., Montevideo, Minn., formerly known as the Starbeck Block Plant, has started production under new managers, Hubert and Alfred Jacobson. The men also operate a block plant in Aitkin.

TWIN CITY CONCRETE PIPE Co., Minneapolis, Minn., has filed articles of incorporation to deal in concrete sewer pipe, soil pipe, roof slabs and blocks. J. M. Lambert, L. A. Sexton, and C. K. Lemm are incorporators.

JOHN P. PEPLINSKI, veteran, has opened a concrete block plant near Glendive, Mont., with a capacity of 900 block per day.

EWING CEMENT BLOCK Co., Canonsburg, Penn., is the name of a new concrete block plant owned and operated by R. J. Ballentyne and W. E. Yoders, veterans.

W. G. SCHROEDER has started construction of a concrete block and tile factory in Adams, Minn.



to a student it's a DIPLOMA—

to a TRUCK MIXER it's—



One of life's greatest moments to the school boy is the presentation of a diploma. It's his certificate of success . . . his mark of achievement.

To a truck mixer, the rating plate of the Truck Mixer Bureau represents something very similar. It is equally representative of achievement . . . of a successful passing of the standards set up by the Bureau for your protection. The rating plate is your guarantee of full rated capacity. You don't guess . . . you know the exact capacity of the mixer.

Truck Mixer Manufacturers Bureau

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION
Pittsburgh, Pa.

CHAIN BELT COMPANY
Milwaukee, Wis.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

RANSOME MACHINERY COMPANY
Dunellen, N. J.

THE T. L. SMITH COMPANY
Milwaukee, Wis.

SELLING CONCRETE In Small Communities

Sutherland Ready-Mix Co., places second batching plant in operation at Pullman, Wash. Reaching out to the farm market

DURING the Spring of 1947 the Sutherland Ready-Mix Co. placed in operation its new plant at Pullman, Wash. This is the second plant operated by this company, the first venture being at Colfax, which is 16 miles north of Pullman. Both are relatively small agricultural communities located in the extreme southeastern part of the state near the Idaho line. At Pullman, the company expects to place some 30,000 cu. yd. of concrete this year and with other business in sight to keep the volume at its present level until at least September, 1948. There are no aggregates produced in the area so sand and gravel is shipped in from Spokane, Wash., a rail haul of about 77 miles. Besides selling ready mixed concrete, the company also distributes sand and gravel.

Even though the area is not heavily populated, the Sutherland Ready-Mix Co. has installed a neat and efficient plant that would do justice to many far larger cities. An all-steel, Noble batching plant has been installed with

Ready mixed concrete truck pulling away from batching plant



the bulk cement weighed automatically through an electric eye arrangement. There are five beams for the aggregate with all gates actuated by air pistons. Lehigh and Spokane bulk cements are delivered to the plant in car lots to a track hopper. A screw conveyor and bucket elevator deliver the cement to a 500 bbl. storage silo. The company may put in additional cement storage with the silo supported on a foundation at ground level.

The type of batcher used here is easy to install as most of the plant came in large sections. The scale section, for example, came in one piece

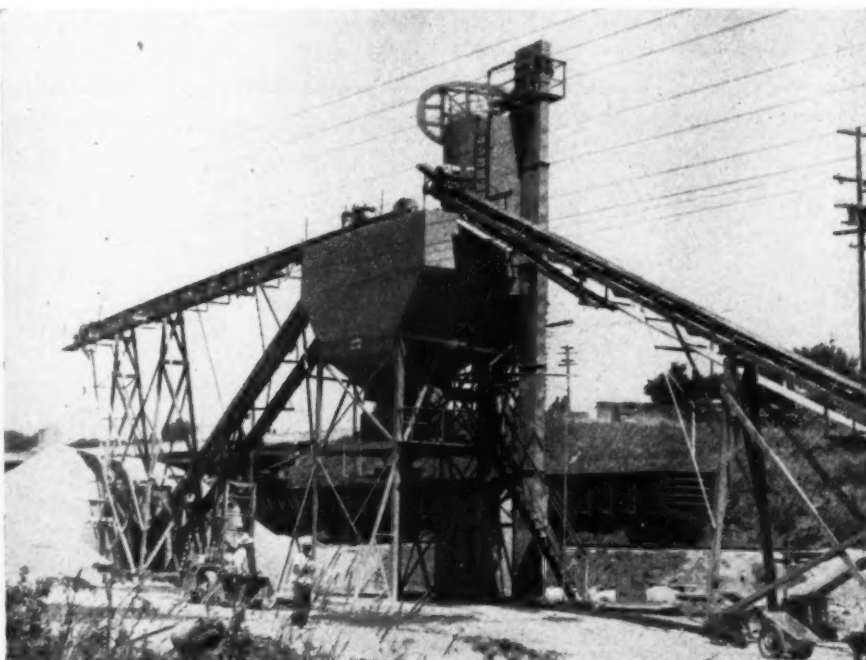
so most of the steel work was installed in two days with two men supplied by the Noble Co., and seven by the owners. The entire installation required seven weeks.

A novel feature is the method of using belt conveyors for storage and reclaiming aggregates: The railroad cars are unloaded to a track hopper served by an inclined belt that operates at right angles to the right of way. This conveyor builds up a sand stock pile which can be reclaimed by a second inclined belt serving the batcher plant. The gravel aggregates are unloaded in a similar manner but a flop-gate diverts this material to the main conveyor and the gravel is carried up to or can pass on over the top of the bins to its ground storage area on the opposite side of the plant. A second inclined belt reclaims this product. Thus, the sand ground storage is at one end of the plant and the gravel at the other end.

One is impressed by the sharp grade of the inclined belts, and the operator advised that conveyor belts were first tried at a 32 deg. angle, but it was too steep so they gradually flattened out the belts until they now ride at a 28 deg. angle. Skirt boards are used on the belts and the gravel sometimes has to be dampened to ride up the slope. There is no difficulty with the sand on these belts. A car load of gravel can be unloaded in 40 minutes; sand, one hour and 15 minutes. The belts are all 18-in. wide and run at conventional speeds.

Conveyors were supplied by the General Machinery Co., Spokane, using Republic Rubber Co. belts. Geared-in-head motors are used on the conveyors. At the Colfax plant the aggregates are dumped to a pit and

(Continued on page 137)



Batching plant with inclined belt conveyor, to the right, delivering aggregates to bins from a ground storage pile

Curing



Modernistic design offices with plant building in the background

Concrete Block Plant Built For the Future

Illinois Brick Co., spends half million dollars for concrete products plant. Production capacity is nearly 60,000 masonry units daily

By RALPH S. TORGERSON

WITH the purchase of the Chicago Insulcrete Co., Franklin Park, Ill., three years ago, the Illinois Brick Co. recognized that the concrete products industry had arrived at a stage of technical development and public demand that called for a substantial investment. Thus, the Illinois Brick Co., Chicago, Ill., one of the largest manufacturers of common brick in the United States, materially added to its large capacity to supply building materials to this large metropolitan area with its enormous demand for housing facilities. This plant is now known as Block Plant No. 1.

After the acquisition of the Chicago Insulcrete Co., it soon became evident that the big post war building demand would require a very large increase in concrete block capacity which the Franklin Park plant could not supply. The management of Illi-

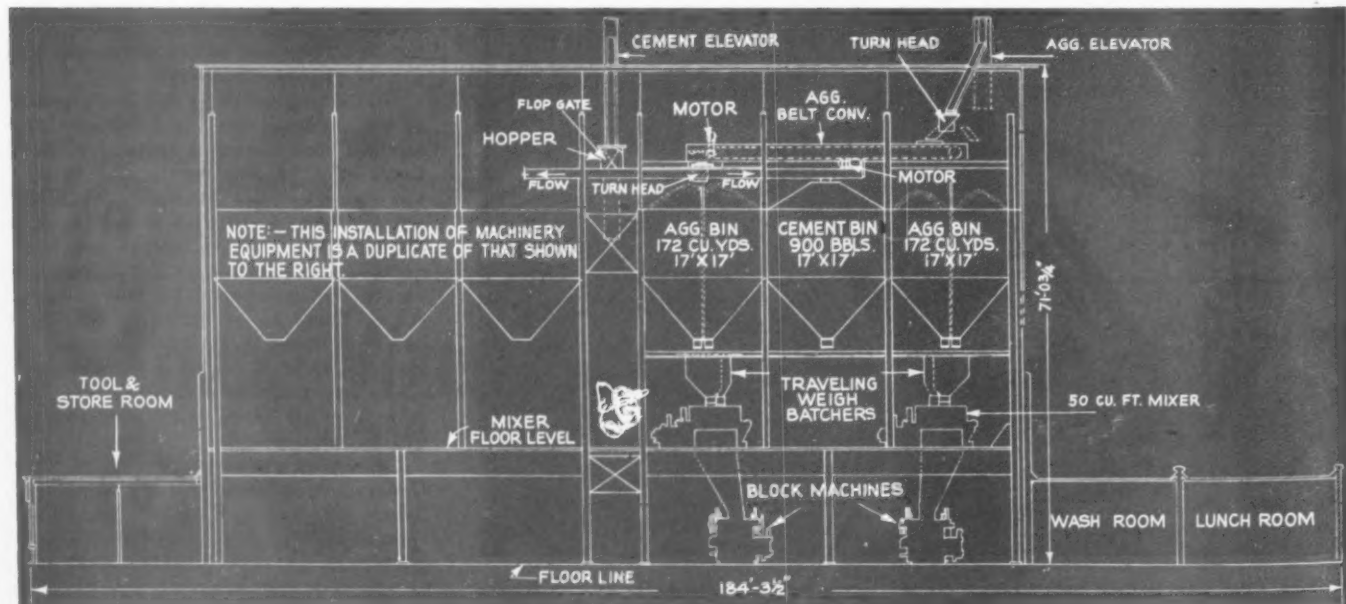
nois Brick Co., through its president, John Goodridge, called upon Hugo Filippi, operating vice-president and chief engineer, to design and build a concrete products plant not only for the immediately foreseeable demand but for the future. Mr. Filippi visited other concrete block plants to study designs and layouts, and finally determined upon the plans which resulted in the construction at Blue Island, Ill. (a suburb immediately south of Chicago) of what is considered one of the most modern concrete block plants in the United States, costing in the neighborhood of a half million dollars.

The plant is located on property which was part of the development acreage of the company's clay brick plant that continues in operation. It is convenient to the principal highways, it has a siding connecting with

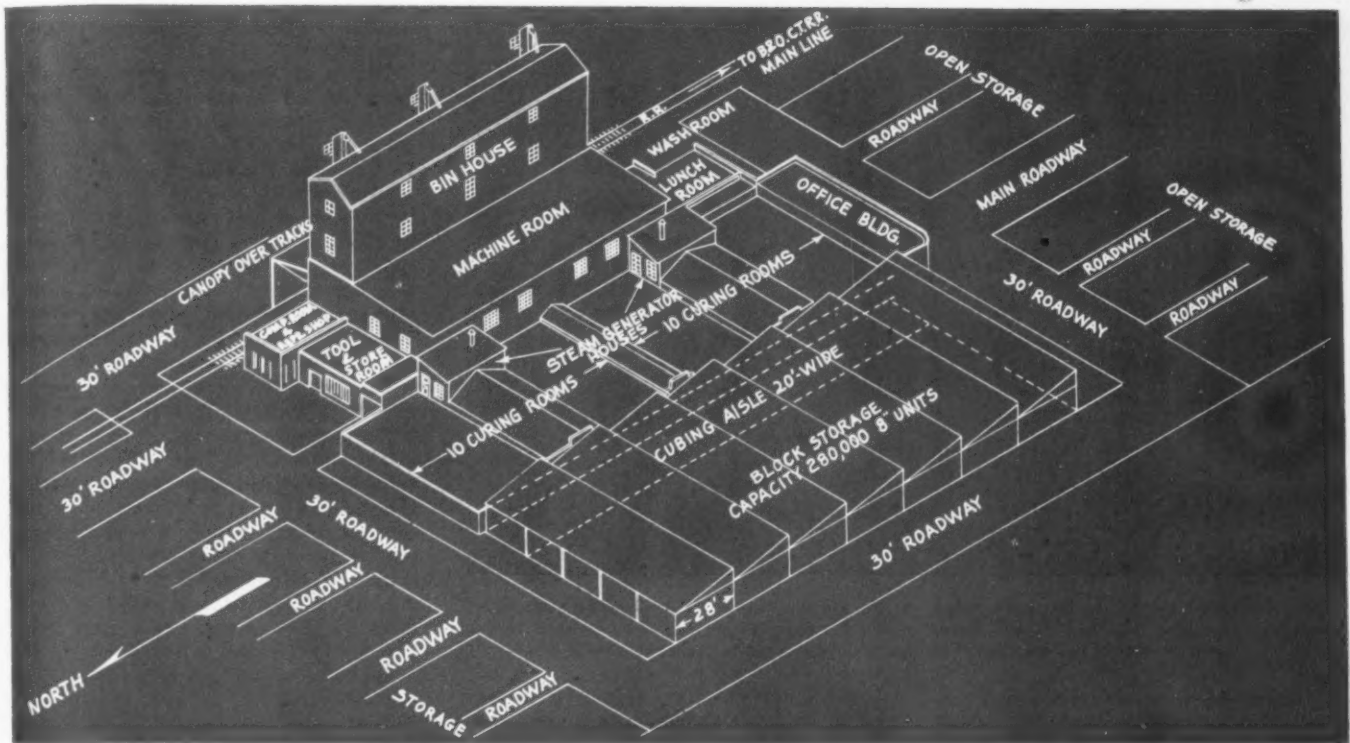
the Baltimore & Ohio Chicago Terminal Railroad for convenient delivery of raw materials, and for rail shipments of concrete products if such a demand should develop. This location is strategically located to supply building materials for this rapidly growing area in the south and southwestern sections of metropolitan Chicago. There is also ample land available for future expansion of this plant and storage area.

As indicated by the illustrations, the block plant buildings themselves typify the business in which the company is engaged. Walls are of common brick and concrete block with a steel superstructure to carry loads. Sheathing and roofs are of Johns-Manville corrugated asbestos capable of supporting loads of 40 lbs. per sq. ft. The layout, elevation, and isometric drawings show the ample room available

Longitudinal elevation cross section indicating the relative location of aggregate and cement bins, elevators, weigh batchers, mixers and block machines



CURING



Isometric drawing showing the location of aggregate and cement storage, block machine room, undercover storage, and outside storage areas

around machines, runways to curing rooms, and covered outside storage. The structure is of sufficient height for gravity flow of materials from bins to mixer and thence to machines below with plenty of headroom and chutes designed for rapid discharge of contents.

Ground was broken late in April, 1946, for this ultra modern plant in Blue Island, now known as Block Plant No. 2, and the plant was in test production January 1, 1947. Considering the difficulties involved in securing materials and equipment, the job set a record for speed of construction. When certain steel sections could not be obtained, other available steel was adapted to the design on the job and when some items, such as doors for the kilns could not be purchased for early delivery, the company designed and made them.

By referring to the layout drawing, it will be noted that raw materials such as aggregates and cement, can be

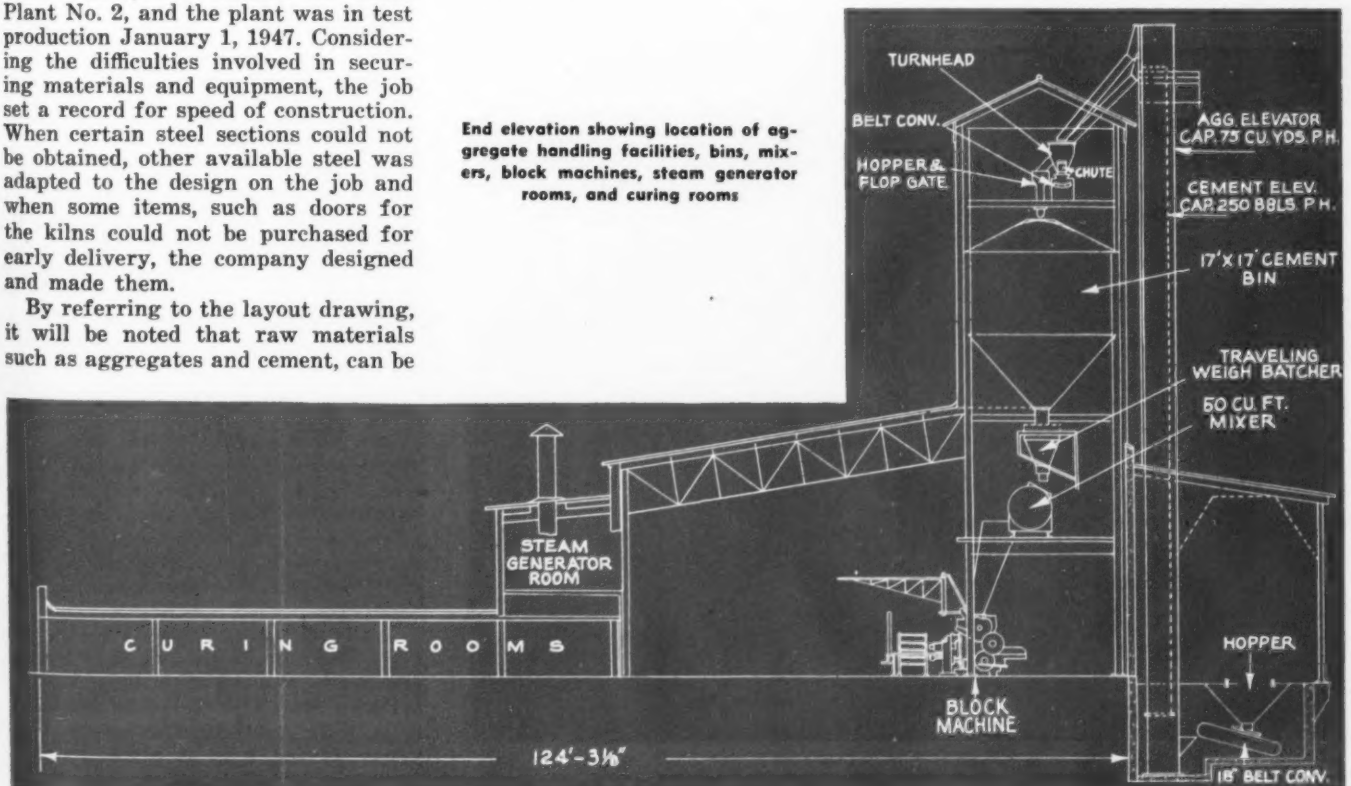
obtained by either rail or truck with unloading facilities under cover. The grizzly openings to the hoppers for rail deliveries can also accommodate trucks. A Clyde car puller hoist spots railroad cars over hoppers.

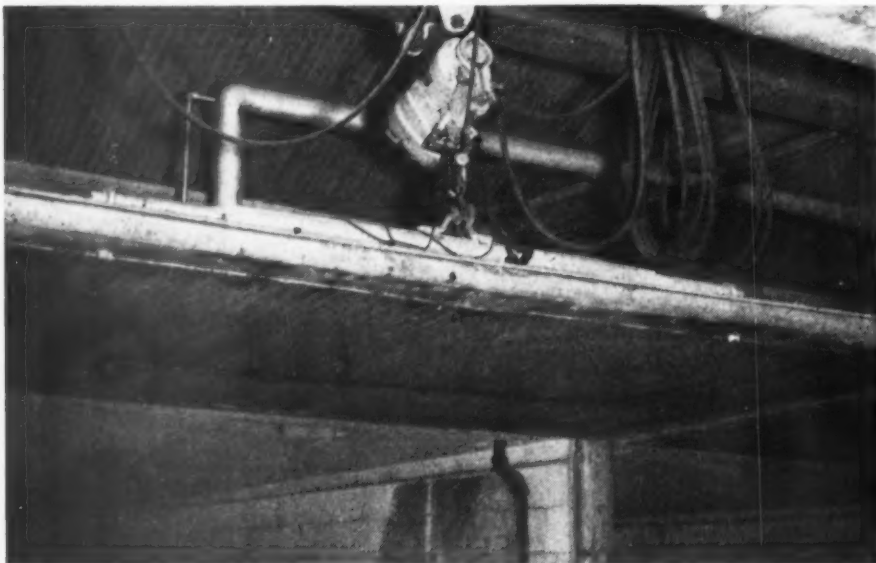
Waylite is used exclusively for lightweight aggregate, but bin facilities are designed to take a variety of aggregates if so desired.

From the hopper, the aggregate moves by 18-in. belt conveyor, 18 ft. centers, to a bucket elevator, 70 ft. high which elevates it above the bins. This elevator has a capacity of 50 tons per hour.

There are four steel bins for aggregates each bin holding 172 cu. yds. with two cement bins, each holding 900 bbl. of cement. Each cement bin

End elevation showing location of aggregate handling facilities, bins, mixers, block machines, steam generator rooms, and curing rooms





Heavy insulated doors for curing rooms, hinged at the top, are raised and lowered by motor-hoist which can be moved from kiln to kiln on an overhead trolley. Steam pipe may be seen to the right, in vertical position, and "impulse" pipe is located horizontally, above

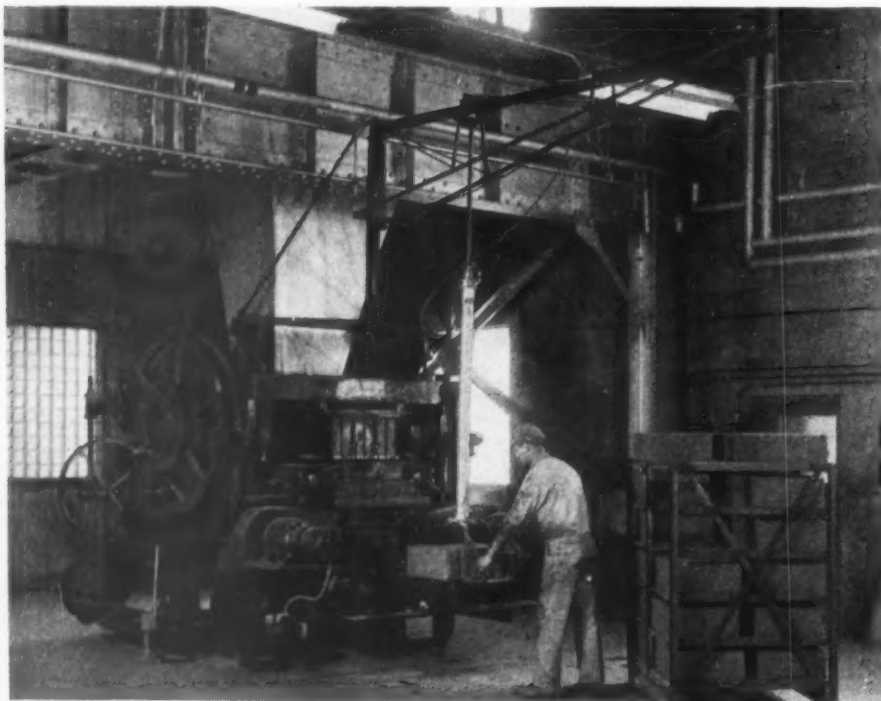
is located in between two aggregate bins. The cement is unloaded from hopper-bottomed bulk cement rail cars through a rubber and canvas boot to a hopper over a screw conveyor, 18 ft. centers, to a bucket elevator, 70 ft. centers, discharging into bins. Cement is elevated into bins at the rate of 30 tons per hr.

At the top of each bucket elevator for aggregates is a turnhead, which may be operated by cable from the ground floor, that directs aggregates to either one of two divisions in the 172-cu. yd. bin or the aggregate can be diverted on a short Barber-Greene covered belt conveyor to the adjacent

aggregates bin. A similar arrangement is available for the aggregates bucket elevator on the other side.

Two Plants in One

It will be seen from the drawings that in reality there are two plants in one, making a very flexible plant layout. It is possible to make four kinds of block using four types of aggregate simultaneously. This dual arrangement is carried throughout the plant, permitting a variety in manufacture and control of production to fit seasonal demands. All bins and most of the conveying and elevator equipment except as noted above,



High production block machine with pneumatic off-bearer

are of Butler Bin Co. manufacture and design.

Below the bins on a mezzanine platform is an interesting weigh lorry system, consisting of two units, one for each side of the plant and serving two 50-cu. ft. Besser mixers. This Butler weigh lorry (50-cu. ft. capacity) is moved on an overhead track by electric motive power, and its movement is controlled by limit switches for accurate spotting under cement and aggregate bins and over mixers. Two weigh lorry operators handle this equipment, one for each side.

In charging the mixer, the aggregates are dumped first, then the water is measured out by Buffalo water meters, and finally the cement is added to give the proper mixing action. Mixing water is adjusted to water content of aggregate. A 5-bag cement mix is usually made and the mixing time is 7 minutes. Waylite aggregate is usually used in two sizes, kept separate; a coarse size, $\frac{1}{2}$ -in. to $\frac{3}{4}$ -in., and a fine size of $\frac{1}{4}$ -in. down, in the proportion of 60 per cent fines to 40 per cent coarse.

There are four Besser Super Vibrac machines on the main floor level, fed by rapid flowing, ample capacity chutes from the four mixers above. Each machine is now operated at a capacity of 5000 8- x 8- x 16-in. block per 8-hr. shift, but if the four machines were operated to full capacity in three shifts, the plant would have the tremendous capacity of 60,000 units daily.

Four Clark lift trucks are used to haul block from the machines to curing rooms, return racks, and move block from curing rooms to covered or outside storage and to load trucks.

Ample room in the plant layout around the machines and to walls separating the curing rooms from the machine room permits very rapid maneuvering of the lift trucks. Steel racks hold 72 8-in. block.

Curing Facilities

There are 20 curing rooms in four batteries of five each. Each curing room has a capacity for 1296 units on 18 racks. Runways, 19 ft. 4 in. wide, for lift trucks are available between 5 curing rooms on each side. Each room is 12 ft., 8 in. wide, 7 ft. high, and 38 ft., 8 in. long, closed at one end. Both roofs and floors of curing rooms slope slightly to the closed end where a drain removes all condensate. The roof at the closed end of each curing room has grooves cut in the ceiling at right angles to the length to cause condensate to drop off into the floor drain before reaching end wall.

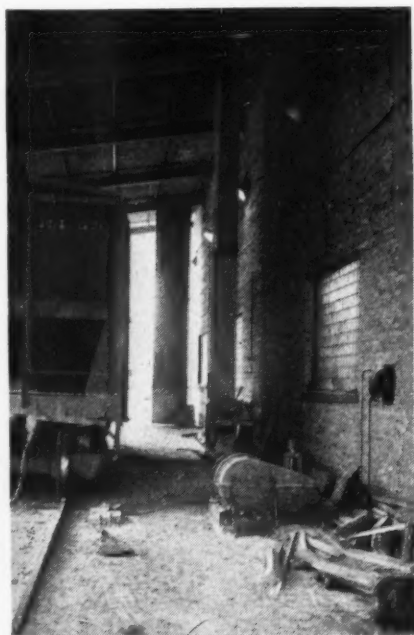
Walls of curing rooms are built of 8-in. Waylite concrete block with inside walls painted with Bond-Tex to act as a seal. The roof over the kilns is a 6-in. reinforced concrete slab vapor-proofed with a pitch coating. On top of this slab, a 6- to 9-in. Way-

CURING



Looking down block machine room, showing two of four machines with mixer and batching equipment on mezzanine, above

lite roof fill has been laid at a slope to drain to a downspout. This Waylite fill is a 12 to 1 Waylite-cement mix. On top of this Waylite fill, a seal or skim coat of cement grout has been placed to provide a smooth surface for a 5-ply, built up asphalt felt roof.



Unloading car of cement under cover. Note bucket elevators for aggregates and cement and car-pulling hoist in foreground

Kiln doors, hinged at the top, were built on a wooden frame with aluminum exterior sheets and filled with glass wool insulation. Refrigerator type gaskets are placed around the periphery of the doors with the bottom of the doors having a strip of rubber belting. Bolts, placed in the masonry walls on each side with special draw-up nuts, make a very tight fit.

On a mezzanine floor across the machine room from the mixers is the boiler room where two oil-fired Clayton 100-hp. flash type steam generators supply steam up to 150 lbs. maximum pressure. These steam generators require only 8 min. to convert cold water to steam, and have sufficient capacity to bring the temperature of kilns up to 180 deg. F. in three hours.

Considerable experimentation was tried for best results, and the steam pressure now carried on the 1-in. steam pipe line into the curing room is 10 lbs. This pipe is not perforated but is simply an open end jet carried just inside the door near the floor line.

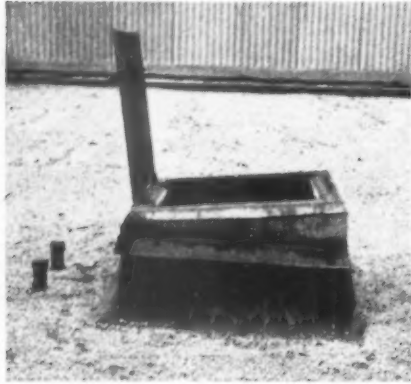
Flow of steam is controlled electronically by a unique system developed by Controls and Instrument Laboratories, Inc., to specifications of the Illinois Brick Co. It is very sensitive and will control temperature within plus or minus 2 deg. on the steam line jet into the kiln. Control is through an "impulse" pipe installed

near the roof of each room. The small pressures of steam vapor entering the open end of this pipe actuates amplifying radio tubes which operate an electric motor controlling a diaphragm valve that in turn controls steam pressure into the line entering the curing room.

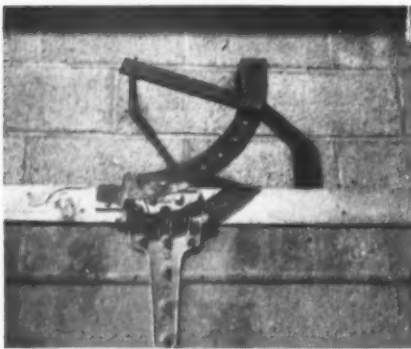


Close-up of weigh lorry, mixer, and block machine set-up

CURING



Test manhole on roof over one of the curing rooms permits lowering of block for testing moisture gain and loss. Two pipes, to the left, are for thermocouple tests



Quadrant which regulates warm air duct opening into kiln



Truck dumping lightweight aggregate over grizzly above same track hopper used in dumping railway cars

After the steam curing part of the cycle has been completed, hot air is blown into the room through ports located in a duct at the top and front of each battery of kilns by Buffalo Forge Co. fans (one for each 10 kilns). Air is exhausted through an opening in the roof at the closed end of each curing room.

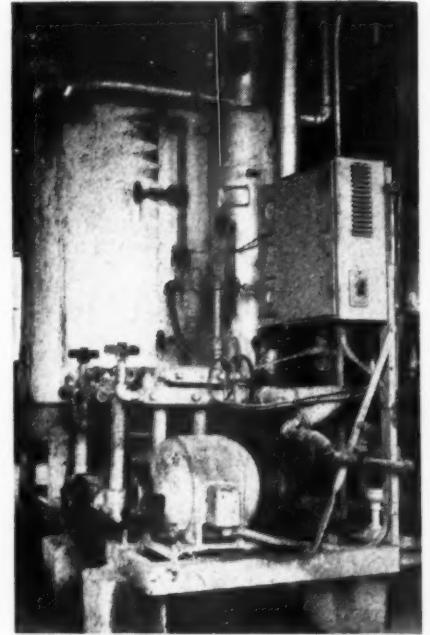
The hot air port opening into each kiln is regulated by a quadrant held in position by steel pins, and can be adjusted in any position so as to admit the required amount of hot air. The temperature of the hot air leaving the fan as it passes into the duct is controlled thermostatically by Johnson system equipment. The cold air is drawn into a duct line in the boiler room and through steam coils supplied by the Clayton boilers. The entire heating system is cross-connected so that if one boiler is down for any reason, the other boiler can supply steam to the other side of the plant or, if required, both boilers can supply steam simultaneously to any one or more curing rooms.

Kiln doors weighing 400 lbs. are opened and closed by small ¼-ton Budgit hoists operating on an overhead trolley, one hoist serving 5 curing rooms.

On the roof of one of the kilns used for test purposes is a manhole with a suitable cast iron cover which is used to lower test blocks for moisture gain and loss during the curing cycle. There are also two brass pipes with screw caps alongside the manholes through which thermo-couples may be lowered for making tests.

The curing cycle for standard 8- x 8- x 16-in. block in the kilns is two hours to fill, two hours for the initial set, four hours at 180 deg. F., then 12 hours of soaking which is followed by 2½ hours of hot air drying, and 1½ hours to cool, a total of 24 hours.

Block passing through this curing cycle have a compressive strength of 750 p.s.i. with 34 per cent moisture absorption. The Waylite Block have



Flash-type, oil-fired boiler which generates steam very rapidly for curing purposes

a pleasing, uniform light color and weigh about 28 lb. as against 42 lb. for 8- x 8- x 16-in. heavyweight block.

This curing cycle produces a block which has a strength equivalent of 21 day curing by the old methods. Normally blocks are loaded onto trucks and moved to the building site as soon as the curing cycle has been completed, but ample covered and outdoor storage is provided for the accumulation of inventory.

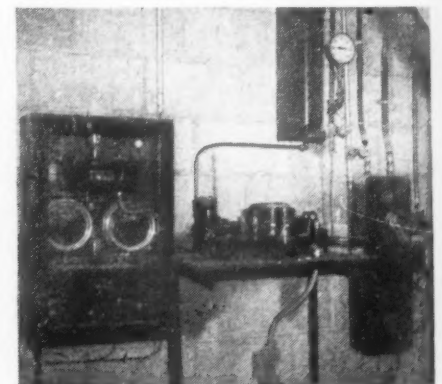
Hauling of block from plant to job site is now all done by contract truckers. Lift trucks raise racks of block to moveable truck bed level loading platforms spotted in the covered storage area so that delivery trucks can be loaded with a minimum of effort.

No cubing of block is done now, but during the winter the company may go to this method of handling. There

(Continued on page 131)

OPERATION	KILN #1		KILN #2		KILN #3		KILN #4		KILN #5	
	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
FILLED	10/30		11/30		10/15		10/15			
STEAM ON	12/30		2/30		13/15		12/15			
OFF	4/30		6/30		4/30		4/30			
VENT OPD.										
AIR ON	4/30		4/30		4/30		4/30			
OFF										

Operation board which gives a visual record of kiln performance



Electronic mechanism for picking up small increments of steam pressure and amplifying them through radio tubes that actuate a motor controlling a diaphragm on the steam line to the curing rooms

Precast Concrete

SPEEDING UP CONSTRUCTION

With Large Structural Units

Cemenstone Corporation, Pittsburgh, Penn., manufactures complete line of concrete structural units of special design which cut building costs

By W. B. LENHART

SEVERAL FACTORS have contributed to the possibilities of successfully manufacturing and selling reinforced concrete structural units which could be profitably substituted for structural steel. First, was the advent of the crawler crane which permitted the erection of heavy concrete units on the job at relatively small cost. Second, the use of high-early-strength cements along with improved plant techniques so that the molding cycle in the plant could be speeded up, and at the same time develop high strengths in the girders, columns or joists with a reduction in size. Third, the development of a system of column, girder, and joist connections that permitted casting in the shop to extremely close tolerances so that when such precast concrete units are assembled on the job the structure can be erected in a very short time with the finally complete building having the rigidity and lateral stiffness that compares with steel construction.

Several years ago the Cemenstone Corporation, Neville Island, Pittsburgh, Penn., started a business based on the theory that large buildings could be erected of precast concrete structural units. The officials of the

infant industry were able to get W. P. Witherow, president of the Blaw-Knox Co., to take a material interest in this long range development program. Feeling their way cautiously for the first several years of the company's life, they year by year developed methods of casting and designs so that buildings erected by this system would meet all specifications as to rigidity, strengths, and cheapness of erection.

A large engineering staff is constantly re-vamping and changing methods so that buildings completed as little as a year ago are now quite different in design. During the past two years, the company has erected a total of 26 buildings, every one of which has been successful. Sixteen of these are in the Pittsburgh area. Many of these buildings were over one story high, thus making another step forward, for we believe this company is the first to erect such structures over this height.

A new building in Washington, D. C., using these precast structural

units, was recently completed. This represented a rather unique experiment for the entire building was pre-engineered and precast in the company's Pittsburgh plant and shipped to Washington by rail and erected on the site. The work included the structural framing, roof decking and side wall panel enclosures. The building measured 120- x 240-ft. The columns were 15-ft high, and the spacing was 24- x 40-ft.

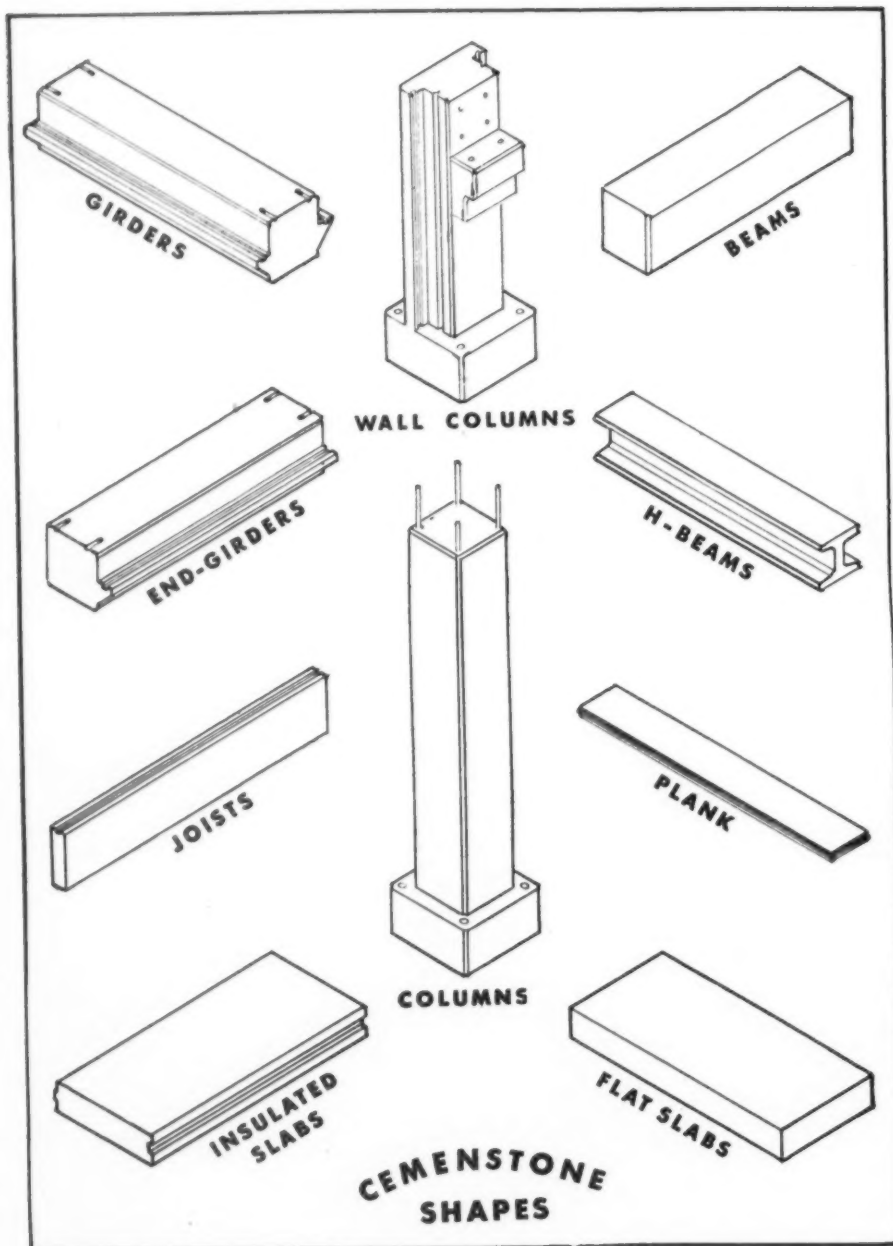
For such structures specifications call for concrete with a 7-day compressive strength of 5000 p.s.i. The column bases are cast with pipe sleeves at the four corners so that steel bolts in the leveling plate will slip into these pipes thus anchoring the columns to the foundations. Obviously these pipes must be set to extreme accuracy to insure close tolerances on the job. Precast concrete brackets are bolted to the columns for supporting the girders. These girders support the precast floor joists by means of "U" shaped, precast concrete brackets bolted to the girders. The use of pipe embedded in the concrete for receiving steel dowel pins is standard practice.



Looking down the production line where large concrete structural sections are cast and cured



Showing some of the heavier precast concrete structural units



Various types of precast concrete structural shapes designed for every requirement

Manufacturing Simplified

To permit the shop fabrication of such a large number of structural shapes required for columns, girders, joists, roof and side panels for buildings of various dimensions, the Cemenstone Corporation has devised its own patented steel form. This form is assembled so as to require essentially only one form for the girders, one for the columns, and one for the joists, etc. The steel form for the girder will make members up to 60 ft. long and up to 16- x 36-in. in cross section. These girders are all heavily reinforced with steel cages made in the company's own shop following the detailed designs of the engineering staff. The pipe sections for receiving the steel dowel pins are all assembled and welded to this steel cage. In the use of the form to get smaller columns than the maximum, special fillers are used. The forms can be heated with steam jackets to accelerate the strengths of the concrete and for winter fabrication.

For handling these huge concrete girders, two electric cranes span the pour room. In each girder is cast several steel nuts that are set flush with the top of the concrete. The nuts are securely welded to the reinforcing. By screwing several eye-bolts into these nuts, the two cranes can pick up the green girder and carry it over to the steam curing room. These rooms have an open top so that sections can be lowered into the room, and then later the removable covers are replaced and the curing carried out.

In a similar manner, the precast concrete columns required can be cast. These columns range from 16- x 16-in. in cross section up to 24 ft. high, although longer columns are on the drawing boards. The joists range from 24-in. in depth up to 25-ft. long.

The wall and ceiling enclosure panels are cast flat on a concrete base of sufficient size to make panels of large dimensions. This concrete slab has steam pipes embedded in it so that accelerated strengths can be obtained as well as for winter operations. In casting a slab, a piece of muslin cloth is placed evenly over the foundation slab. On top of this is placed a form made of 2- x 6-in. lumber, and surrounding the lumber form is the steel form to insure rigidity. Nails protrude into the concrete from the lumber form and the latter is not removed, nor is the muslin, until the slab is delivered on the job and ready to be erected. This system protects the edges of the large panels from damage. The muslin cloth gives the face of the slab a very pleasing finish. Slabs are generally cast 6-in. thick.

Smaller structural units such as the joists are cast in a special steel form so designed that several (up to six) could be cast at one time, using the full length of the form. However, the

form is long enough for two or more shorter joists to be cast in each of the forms by having suitable blocks between each end section. These forms are also steam jacketed. By the use of high-early-strength concrete, a complete curing cycle can be completed in these forms in three hours. When the forms are ready to pour, concrete is mixed in a drum type, Blaw-Knox mixer and the material carried over the forms by the overhead electric cranes. In addition to structural shapes of large dimension, the company has just introduced a novel reinforced concrete window sash that can be used to replace wood or metal sash. The illustration gives a better picture of this development than words.

Cut Construction Costs

Factors that will lend themselves to the success of this pioneering company in the structural field are many: First, there is the question of costs, for to compete with structural steel, building costs must be competitive. By the use of precast concrete structural units, a saving over straight structural steel can be effected depending on location. Precast concrete construction is definitely 10 to 20 per cent cheaper than monolithic construction or other fire-proof construction, according to officials of the company. Because of the accuracy of the precast sections, a building can be erected in a matter of a few days. A two-story building in the Pittsburgh area was completed in 13 days by a crew of six men and an 18-ton crawler crane. This building was 110- x 120-ft. in area with 20- x 22-ft. column spacing.

While activities of the company up to date have been confined to Pittsburgh, Penn., and the other areas mentioned, it is planned to extend the application of this pre-fabrication system to all sections of the country and abroad through companies suitably financed to carry out programs similar to those now undertaken in the Pittsburgh area, and who will operate as licensees of the parent company under such an agreement that Cemenstone Corporation will have control of all phases relating to specifications and quality of workmanship. This is important for it is desired to make certain that any licensee using these patented methods will manufacture precast units and erect buildings that will be flawless.

Offices of the Cemenstone Corporation are at the plant on Neville Island, near Pittsburgh, Penn. A. C. Grafflin is vice-president and general manager and Albert Henderson, consulting engineer.

Ready Mix Plant

BUFFALO GRAVEL CO., Buffalo, N. Y., has received permission from the city to erect a \$50,000 concrete mix plant in Buffalo.

ANOTHER CEMENSTONE FIREPROOF STRUCTURE



WILSON SPORTING GOODS COMPANY • 3416 FIFTH AVENUE • PITTSBURGH, PENNSYLVANIA

TO: The Cemenstone Corporation
FROM: Mr. Calvin A. Landau, President
Landau Brothers Building Co.
(Contractors for this job)

"We were quite pleased with the way this job was engineered, fabricated, and erected by you. All of the concrete members fit perfectly and were of a very dense, hard, and well-finished concrete. Your erection crew handled the erection of this material in a very efficient manner, causing us no inconvenience whatever. The fireproof and waterproof qualities of your material have a very definite advantage in a building structure. Lack of usual maintenance is also a distinct economical advantage."

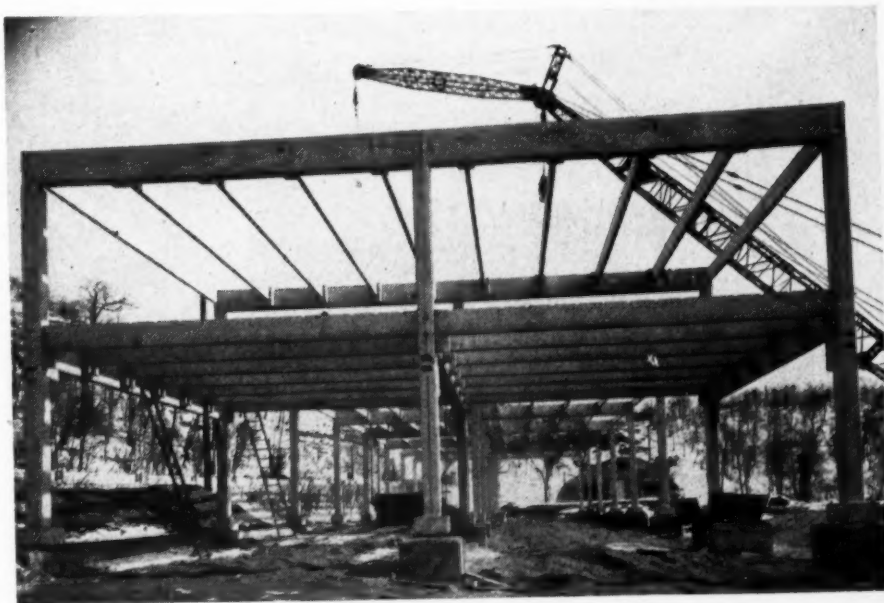
Let us estimate your building requirements, no matter how large or small. Consult your architect, engineer or contractor. Estimates gladly submitted without obligation, for standard or special design one or multiple story buildings, structures, or special floor slab or roof requirements.

THE CEMENT STONE CORPORATION

Manufacturers of Precast Reinforced Concrete structural elements for FIREPROOF CONSTRUCTION

NEVILLE ISLAND • PITTSBURGH 25, PA. • FEderal 3346-5641

A typical newspaper advertisement which appeared in the Pittsburgh daily papers



Superstructure of this building only required three days to erect, using precast, reinforced concrete

Merchandising

COLORED BLOCK

Increase Sales

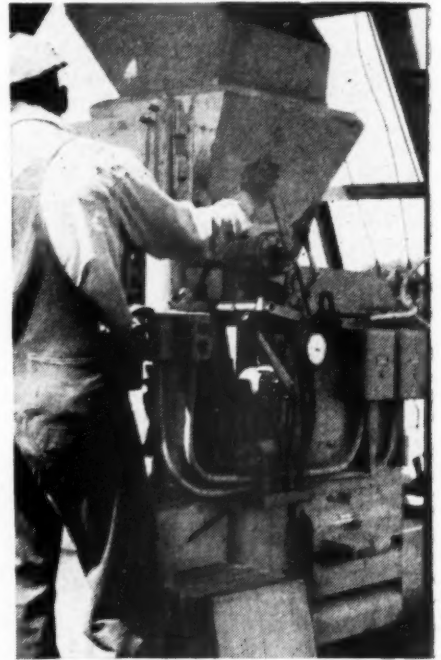
Henry Logsdon, Fruitland, Idaho,
manufactures colored concrete blocks
on a hydraulically operated machine

By W. B. LENHART

MANY people in the United States have only a hazy notion as to the extensive developments going on in certain parts of the West. Progress in California and in the Coastal cities has been emphasized again and again so that most people when the West is mentioned think of the Coastal section, particularly the areas around Los Angeles. But there are now virtual empires in themselves being built in other sections of the West.

Another empire in the making is related to the Grand Coulee dam. The recent war stopped all but power developments in that area, but now the irrigation phases are being vigorously pressed and soon the "Inland Empire," as it is known in the area, will be a

reality. It will support millions of our citizens. We could go on in this manner mentioning the various large rivers of the West such as the Salmon, the Snake, etc. Irrigation projects along this latter river are responsible in a great measure for the development of the Nampa-Caldwell and Boise, Idaho, sections. But in between these larger and more well known cities are multitudes of small farming communities. While small, they are growing rapidly and the amount of new construction going forward is very impressive, especially compared to many of the older and more settled eastern communities. Concrete masonry is playing a large part in all these developments, and small but efficient



Air control mechanism for operating hydraulic block machine

plants have sprung up in most all the towns along the highways.

At Fruitland, Idaho, which is a small farming town about 22 miles south of Weiser, Idaho, and almost on the Idaho-Oregon state line, Henry Logsdon has established a neat little concrete block plant using equipment



Skip holding aggregates and cement dumping to pan type mixer



Hydraulically operated concrete block machine

manufactured at Vancouver, Wash., by the Columbia Machine Works. The plant is a completely pre-fabricated unit of all-steel construction, and has been engineered to make it an efficient and compact unit. The various cycles of the manufacturing steps are all controlled by manually operated valves that actuate oil-hydraulic pistons. A 1-hp. General Electric motor is used on the Roper oil pump, with the block machine, exclusive of the mixer, using a total of 3 hp. The block is vibrated under pressure and goes through the following cycles: (1) pallet placed below piston assembly which rises to its proper position; (2) horizontal plunger, oil piston actuated, pushes box with concrete mix in it over the forming plungers; (3) vertical steel plungers drop onto the top of the concrete; (4) vibration imparted to the form; (5) plunger pushes block with the pallet and lowers it to the starting position. The blocks and pallet are removed by hand.

At the time of inspection a precision red-colored block, 4- x 8- x 12-in., was being made at the rate of 2000 per 8-hr. shift. One sack of "Sun" cement, (Oregon Portland Cement Co.) to 20 to 21 large shovels of sand (no coarse aggregate) was being used. To this was added one pound of Light Indian Red (R 957) and two pounds of Trinity waterproofing cement. The green block are piled on steel racks each holding about 300 of the 4- x 8- x 12-in. block. The rear end of all these racks has rubber wheels of small diameter. The front end is supported by steel legs. The racks are moved about the small concreted yard by a Nutting hand truck. Wood pallets of plywood are used, some being $\frac{3}{4}$ -in. thick and some $\frac{1}{2}$ -in. No curing room was used, the block being stored on the racks until set enough to be piled in the yard. The block make a most excellent looking structural unit with sufficient strengths to easily meet all local codes.

The mixer, supported by steel columns on a platform over the block machine, is served aggregates and cement by an inclined skip. It is of the horizontal pan type with the pan moving in a circular motion and the four rabble arms inside the pan being stationary. Water for each batch was sprayed onto the mix by the operator with a garden hose. The mix was rather dry. The pan is about 6-ft. in diameter and 18-in. high, and is driven by a 7 $\frac{1}{2}$ -hp. Fairbanks, Morse motor through "V" belt drives. The pan discharges at the bottom through a coned gate. The colored blocks of the size being made are very popular in the district and sell for 11¢ each. Three men are employed. Henry Logsdon, the owner, has his home nearby built of these colored block, and it is a very neat appearing structure. In addition to his block business, Mr. Logsdon is engaged in trucking contracting with some sand and gravel.

Build Block Plant for the Future

(Continued from page 126)

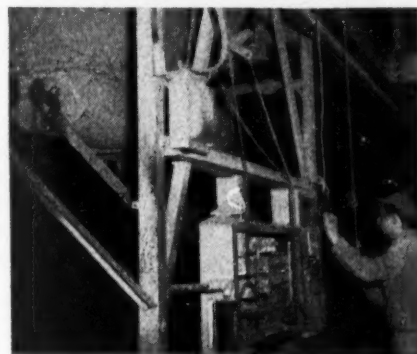
is at present no advantage in this method as most of the block moves direct from the curing rooms to the truck loading platform. Covered storage is sufficient for 300,000 block, and there is also an outside paved storage area of 24,000 sq. ft. Deliveries of block are made within a radius of 30 miles.

There are four operation boards, one for each battery of kilns. These blackboards provide a record for each kiln, giving date and time when kiln is filled, steam on, steam off, vent open, air on, and air off.

The plant has been provided with ample lighting, ventilation and heating. Unit heaters are suspended from steel trusses, or from ceilings, and

is an economy in selecting motors to fit specific operations.

The block plant has its own gasoline pumps for trucks, and fuel oil storage tanks are buried below the

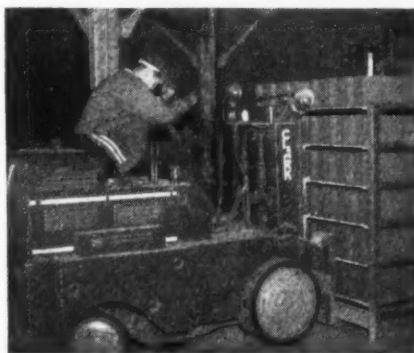


Close-up of weigh lorry for aggregates and cement

outside pond area with float valves controlling motor-driven pumps that supply the Clayton boilers' auxiliary tanks.

It is later planned to go into the manufacture of concrete lintels, joists, and other concrete specialties, but the plant is now too busy making block.

When the Chicago Insulcrete Co. was purchased, Henry Buchholz, the principal owner of the company, who was largely responsible for its development as one of the outstanding concrete products companies in the Middle West, came with Illinois Brick Co. as manager of the Concrete Products Division. For the past year Mr. Buchholz has been president of the



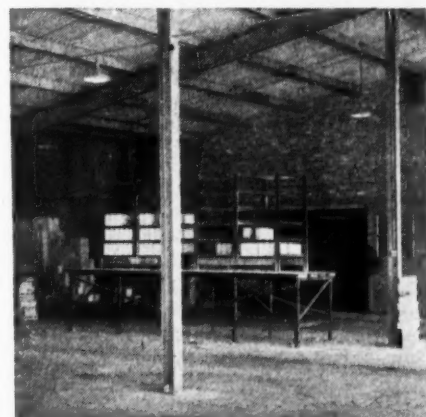
One of a fleet of lift trucks to handle block from machine to curing rooms, truck loading platform, and storage

are thermostatically controlled for uniform heating. Fluorescent lighting is provided in the block machine room, offices, display room, and other working areas for maximum worker efficiency.

Employees have a modern wash and change room with lockers and also a lunch room. In the display room are samples of all the products manufactured or sold by the company. The ceilings in all service buildings are of 4- x 8- x 16-in. Waylite blocks laid between reinforced concrete I beam joists.

All steam pipes are covered with asbestos insulation, and water pipes are covered with Air-Cell insulation to prevent condensation. An interesting and very practical method of identification for all piping, water, steam, and electrical conduit, is a system of colored bands painted at regular intervals to indicate whether the conduit contains a 110, 220 or 440 volt line, and also to distinguish between hot and cold water and steam lines.

Electric power is supplied by the power company at 13,000 volts a.c., and is stepped down in the company's transformer station to 440, 220 and 110 volts. This gives flexibility in arranging for motor requirements, and

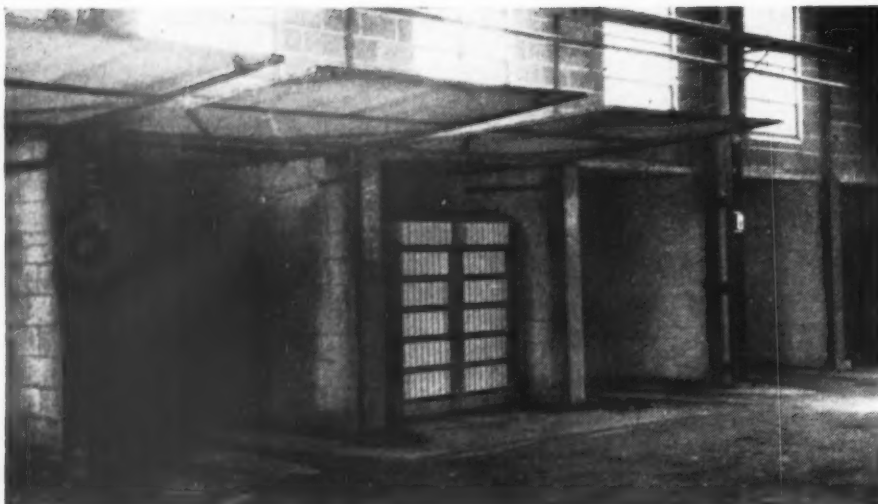


Steel loading platform from which delivery trucks are loaded

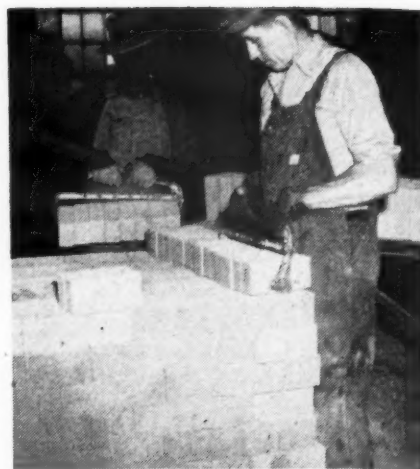
National Concrete Masonry Association, and has been active for many years as an officer and director.

Al Neubeiser, who was formerly with Henry Buchholz at Franklin Park, is plant superintendent at the Blue Island plant.

DIXIE READY-MIX CONCRETE, INC., Orlando, Fla., has filed articles of incorporation listing 100 shares of no par value. Roy T. Taughlin, Marion R. Lottce, Walter Johnson, and Robert H. Frailey are incorporators.



Concrete brick curing rooms. There are a total of six



Cubing concrete brick before moving to yard storage. A "cube" of brick weighs 4000 lb.

CUBING Concrete Brick

Columbia Concrete Products Co.,
Inc., manufacturing modular concrete brick on block machine

By DAVID MOCINE

AN order for 2,000,000 modular concrete brick marked the entrance of Columbia Concrete Products Co., Inc., into the brick manufacturing field. Such an order speaks well for the reputation Columbia holds in the Toledo area, since the company had never made brick before construction of the present plant.

This company is in a good position to undertake a new venture of this sort, having been in the concrete products business for 45 years manufacturing block, roof slabs, lintels, and other specialties. Sources of supply for cement and aggregate are already established; information concerning concrete mixes, gained from long experience with the block plant, is readily available; merchandising and product distribution channels are already worked out; and curing cycles and cubing are familiar matters at Columbia. Also experienced help in allied fields is already on the payroll.



Concrete brick are made on a high-production block machine

The new building housing the plant is of cinder block construction, utilizing the product of Columbia's block plant. A Besser Vibrapac, with plain steel pallets, enables the plant to turn out 40,000 modular brick in a one-shift day. The machine must be flexible, as both sand and gravel aggregate and cinder brick are made in the same plant; and also, the company plans to use the machine for block production if at any time the brick stock becomes inventory heavy. (Two similar machines are operating in the block plant.)

Aggregate is brought to the mixer from stockpiles outside the building by a gasoline-engine powered Clark bucket scoop truck. Bulk cement is used in both plants, but where the block plant has an overhead bin system for aggregate and cement storage, coupled with elevated mixers, the brick plant utilizes a skip hoist for charging the brick machine from a 50-cu. ft. Besser batch mixer located below floor level.

Brick are removed from the machine by a pneumatic off-bearer and placed on racks of 768-brick capacity. Loaded racks are taken to the kilns by a Clark lift truck. Columbia's new brick plant has seven kilns, each measuring 7½- x 8- x 80-ft., and of cinder concrete block construction with a 4-in. concrete roof slab topped with 6 in. of cinder block for insulation. The schedule calls for a 24-hr. curing cycle, with 3 hr. to build up to 180 deg. F. The steam is then cut off, and it has been the company's experience that in the 20 hr. period that follows

there is a drop of only 40 deg. in temperature. The kilns are then exhausted by individual fans for ½ hr., and the brick brought out and cubed in the plant before being stored in the yard. After one day in the kiln and four in the yard, the brick meet all A.S.T.M. specifications for class "A" brick in every respect, testing at more than 1100 p.s.i.

The kilns in both the brick and block plants are equipped with Triage recording thermometers and both plants have new 150-hp. Kewanee low pressure boilers, equipped with automatic controls, safety devices and coal stokers.

One of the pioneers in the art of cubing block, Columbia has now extended this system to brick handling. A cube of sand and gravel aggregate brick contains 800 units and weighs 4000 lb. A cube of sand and gravel block contains 75 units at 3100 lb.; while cinder block cubes contain 90 block at a weight of 2700 lb. Columbia Concrete's modular brick measure 2¼- x 3½- x 7½-in. The company haulage fleet consists of five Fruehauf semi-trailer units (two of which are equipped with six-wheel trailers in addition to the semi's), four flat beds and one dump. Other trucks are contracted as needed.



Charging the below-floor mixer with lift-truck loader. Cement is now handled from overhead bins, replacing sacked cement

Nine acres that comprise company property provide ample room for expansion, and a third plant for the manufacture of roof slabs, Flexi-core and other precast units is contemplated. The present block and brick plants are about 1000 ft. apart, separated by railroad trackage.

Washington Pipe Meeting

CONCRETE PIPE & PRODUCTS ASSOCIATION held its 19th annual fall meeting on September 20, 1947, in the Arctic Building, Seattle, Wash., with 52 in attendance from Washington and Oregon.

The programmed meeting opened at 1:30 p.m. with Wm. R. Mason of the faculty of the University of Washington reporting on the reinforced concrete culvert pipe tests made on the new 2 million pound testing machine at the university.

Ten sections each of 36-, 48-, 60-, and 72-in. pipe were tested to destruction, half of each size by the sand bearing method and half by the 3-edge method, to determine further information on the ratio of ultimate strengths between the sand bearing and 3-edge methods of test. Results indicated the need of change in both the existing sand bearing and 3-edge ratio, Mr. Mason said.

BAILEY TREMPER, materials and research engineer of the Washington Department of Highways, also discussed the tests and emphasized the need of supervision of each phase of the manufacture of reinforced concrete pipe.

VERNE FRESE of the Layrite Concrete Products of Seattle reviewed the use of pumice as a concrete aggregate in Germany and Italy, stating that the suitability of pumice concrete depends largely on the structural hardness of the pumice.

PAUL KLEMENS of the Smithwick Concrete Products Co., Portland, Ore., formerly with the Besser Mfg. Co., told of the use of pumice in Portland. A general discussion on the use of pumice as a concrete aggregate followed with Messrs. Freese, Klemens, and Lloyd Williams, a pumice distributor of Bend, Ore., answering questions.

General opinions were that the problem of manufacturing satisfactory pumice masonry units is more difficult than manufacturing masonry units with sand and gravel aggregates; that studies should be made to develop a yardstick to determine the suitability of pumice units under different conditions of use; that there was considerable danger to the future of the industry from the manufacture of pumice units by small plants giving little attention to details of manufacturing and curing; and that the industry should take action to protect the public from the use of these poor units.

Officers of the Association are as follows: president, Thomas P. Nash of Bellingham Builders Supply Co., Bellingham, Wash.; vice-president,

George P. Duecy of Associated Sand and Gravel Co., Everett, Wash.; secretary-treasurer, A. B. Metcalf of Columbia Concrete Pipe Co., Wenatchee, Wash.; and directors, Talbot Campbell of Seattle Concrete Pipe Co., Seattle, Wash., and F. M. Kettinring of Graystone Concrete Products Co., Seattle, Wash.

Test Water-Repellent Coatings for Masonry

IN ORDER to provide interested individuals and the building industry as a whole with much-sought information regarding the durability of decorative and water-repellent coatings for masonry surfaces, National Bureau of Standards conducted a number of exposure tests over a six year period on many commercial masonry paints, results of which have just been released.

Wall specimens of stone and cinder concrete block, lightweight-aggregate block, new and used common brick and cast-concrete slabs were coated with cement-water, resin-emulsion, oil-base, and rubber-solution paints.

The latter three coatings were also applied to wood-frame walls faced with cement-asbestos shingles. Prior to coating, some of the walls were given base coats of grout, consisting of equal parts of white portland cement and mortar sand mixed with water. This base improved the painting surface by filling voids in the block and closing openings in mortar joints.

After coating, the walls were exposed to atmospheric conditions in Washington, D. C., for periods of three and six years. Results as a whole were favorable. The cement-water paints provided a durable and decorative coating, satisfactory for the initial painting of all new masonry with the possible exception of cast concrete poured against oiled forms.

Oil-base paints were found to have the best results on close-textured masonry or open-textured surfaces that had been moisture proofed. Resin-emulsion paints also provided good coverage on all exterior masonry walls. Rubber-solution paint was especially suitable on the cement-asbestos shingles or siding.

Available Washington State Pumice Deposits

WASHINGTON has two extensive pumice deposits that are commanding special attention at this time as sources of lightweight aggregate for concrete block manufacture. In the past, approximately 80 per cent of all pumice consumed in United States was used for abrasive purposes, but the tonnage expected to be used by the concrete block industry will apparently dwarf all former consumers combined.

Wide variation exists between the various pumice occurrences in this state, with a range of from 30 to 100 per cent passing minus 4-mesh. The finer grades of pumice, or "sand," are usually designated as pumicite, and deposits of this material are likewise extensive.

cross-section of a Washington pumice deposit:

	Inches
Silty soil (overburden)...	13
Buff-colored pumice	25
Sand	3
Gray pumice (older layer)	35
Silt, sand, and rock fragments (base concealed).	6+

Weight per cubic foot, after being air-dried at 70 deg., also varies widely, but averages about 38 lbs.

Though the two principle deposits in Washington are separated by about 100 miles, they both lie mainly in the Columbia river water shed. These deposits are from the two volcanoes: Glacier Peak, immediately west of the crest of the Cascade range; and

Pumice Screen Analysis (by weight)							
Tyler Standard Screen Scale (per cent retained on sieve)							
	0.74-in.	0.37-in.	4 mesh	8 mesh	12 mesh	20 mesh	Minus 20 mesh
(Average of ten)	5.6	18.0	28.1	19.8	9.5	6.7	12.3
	Total						
	100.0						

Pumicite Screen Analysis						
	Plus 20 screen	20	65	100	minus 200 screen	Total
(Average of ten)	0.5	3.4	3.0	18.0	75.1	100.0

About 15 pits are now being worked in the state. They are all open workings, mostly using dozer equipped crawlers and loading ramps. The few that have access to a railroad ship by this means to towns in western Washington, while the remainder use trucks to haul from the pit.

Most known deposits of commercial depth have been built up by either wind or water action, and for the most part have from a few inches to 2-ft. overburden. Thickness of beds varies greatly, and ranges from 14 ft. to 2 ft. or less, with the average being in the neighborhood of 6 ft. A typical

Mount St. Helens, in the southern part of the state. The three remaining major volcanoes in the state: Mounts Baker, Rainier, and Adams, are apparently devoid of pumice deposits.

There have been several recent volcanic eruptions in the state, but apparently they issued from minor orifices without the accompanying explosive violence necessary to produce pumice. Both known deposits consist of two layers of pumice, separated by a thin strata of clay, silt, gravel and/or debris, with the lower pumice strata being the thicker in most instances.

NEW MACHINERY

Hand Truck for Block

R. S. REED CORPORATION, Three Rivers, Mich., has designed a hand truck with forks to pick up and transport six concrete blocks at a time. When



Hand truck designed for ease in handling concrete block

block are removed from pallets, they are stacked on the floor, six high with bottom block face down. The hand truck or Block-man, as it is called, picks them up for stockpiling in the yard or on a transport truck. Forks are extended when used on light-weight block so that two stacks of six or 12 are handled at one time. With one block used as a pallet, other materials likewise can be handled; such as, cement pallets, bricks, etc.

The truck is of tubular steel, all-welded construction. It is equipped with rubber-tired wheels having ball-bearings. The handles have rubber grips. Where the truck is required to move down an incline, it can be equipped with a hand brake, if desired.

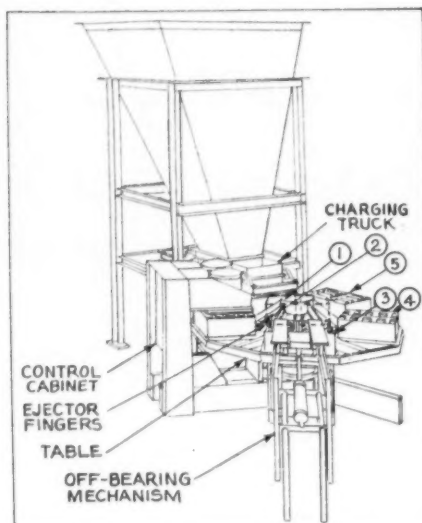
Air-Hydraulic Block Machine

HENRY & HUCHINSON, INC., Decatur, Ga., has developed a concrete block machine which has a 24-hr. capacity of 28,800 block. The machine is air-hydraulically operated, electrically controlled and timed. Air is supplied by a 210-cu. ft. compressor at 125 p.s.i.

Essentially, the machine consists of a rotary table mounting five equally-spaced mold boxes, each mold box containing two 8- x 8- x 16-in. block molds, with ten block being produced with every revolution of the table.

Four operations are performed at four stations. Each table rotates in a counter-clockwise direction viewed from above.

Sequence of operations is as follows: Station No. 1 comprises a hopper, a charging mechanism and a vibrator, where the vibrating operation is performed. At station No. 2, the block is compressed and formed to size by two large air cylinders, the forming pressure being adjustable from zero to 12,000 lb. to suit the type of block and aggregate being used. At station No. 3, the blocks are stripped from the mold by a hydraulic cylinder, and an off-bearer removes the block from the machine. The off-bearer may be either manually or automatically operated, depending upon the user's requirements, utilizing a conveyor to



Air-hydraulic block machine with capacity of 28,800 block in 24-hr.

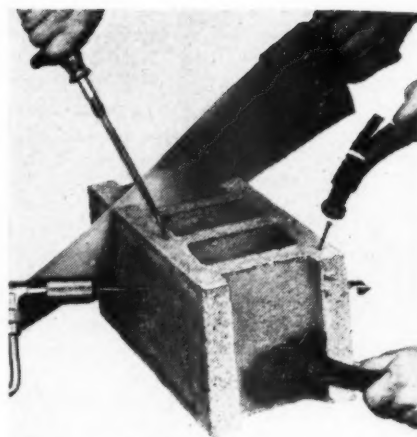
deliver block to curing rooms. The mold boxes are lined with 1/4-in. armor plate. At station No. 4, pallets are replaced and the mold forms inspected.

Sawable Block

MARKETING ASSOCIATES, Saginaw, Mich., has announced what has been called, the Mul-Kra "Wonder Block." These blocks are made with a mix based on a patented formula, including wood fibre and special mastics, and cement, which are produced on conventional block making equipment.

It is said that these blocks can be sawed, sanded, drilled, nailed, screwed, and they contain much of the same working properties as wood. Testing laboratory reports, it is claimed, confirm a high compressive strength and thermal conductivity. It is said that the insulating value is ten times that of heavyweight concrete block. The block are fire-resistant, and it is said that under laboratory testing, did not burn when subjected to flame tests at 900 deg. for two hours.

Carl Kranz is the owner of the patent. These blocks are now available locally in several States, and ap-



Concrete block which can be nailed, sawed, drilled and screwed

plications for operating franchises are now being accepted in other States.

Hand-Operated Block Machine

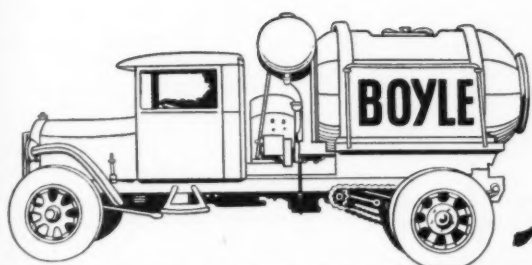
FRANKLIN MACHINERY Co., Bloomfield, N. J., is in production on a small, economically-operated block machine. Although manually operated, it is claimed that 300 to 400 block can be made by a good operator in 8-hr.

Operating procedure is as follows: With the hand lever in position away from the operator, a pallet is placed in the mold compartment and the hopper pulled forward in loading position. The concrete mixture is then shoveled into the mold box through the hopper and hand tamped, after which, the hopper which also serves as a troweling device is pushed away from the operator, over the top of the block, carrying with it any surplus material later to be used in the next block formed. The hand lever is pulled forward to raise the newly formed block



Manually-operated block machine is easy to operate

with the pallet from the mold box. Both the newly made block and the pallet are lifted away from the machine to "set" over-night and then stockpiled in the yard.



*Why is DOYLE Selling
More Concrete than BOYLE?*



Because He Knows *Beauty* Pays Dividends

**HIS SMITH-MOBILE HAS
ALL THESE *Features***

- Dual Water Injection System
- Cold Weather Protection for Water System
- No Water Bell or Nozzle Inside Drum
- Gravity Flow Feed Chute Charging
- No Leaky Loading Hatches
- Real Visible Mixing
- Larger Drum — Increased Capacity
- Lower Weight — Bigger Pay Loads
- High Discharge Directly into Forms
- Controlled Slow or Fast Discharge
- Perfected Drum Closing Door and Seal
- Famous Smith "End-to-End" Mixing Action
- Direct Connected Motor with 3-Point Suspension
- Improved Transmission Cushioned in Rubber
- Beauty Combined with Performance

Doyle is smart! Like many other Ready Mixed Concrete Operators he knows an investment in improved, modern equipment pays off in the long run. He also knows the value of having his name on equipment that combines beauty with performance . . . *an effective, mobile advertisement for his business.*

Check Smith-Mobile's many time-tested, profit-making features. Frankly, can you think of any other truck-mixer on the market that gives you so much for your money?

No matter how you look at it, Smith-Mobile gives you all the features you need in mixing and delivering concrete, plus **BEAUTY** that makes you proud to say: "She's part of our fleet."

THE T. L. SMITH COMPANY, 2885 N. 32nd St., Milwaukee 10, Wis., U.S.A.

SMITH  MOBILE

The Original High Discharge Truck Mixer and Agitator



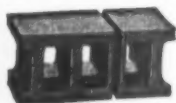
Clipper Masonry Saws

Your Special Size and Shape Brick or Concrete Block can now be "Tailor-Made" at a moment's notice!



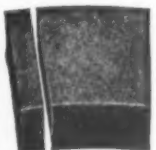
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.



One of the many intricate cuts performed on first quality clay brick for heat treating furnaces—made in 8 sec.

This concrete block, converted into a special size, was cut completely in two in 19 seconds.



Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds!



CLIPPER MFG. COMPANY
Warwick at 28th, Kansas City 8, Mo.

Concrete Association Meets

SOUTHERN ILLINOIS CONCRETE Products Manufacturers Association recently held a business meeting at the plant of the Sesser Concrete Products Co., Sesser, Ill. After the business meeting, the group was taken on a tour of the company's plant to inspect a Korpac block machine and other recently acquired equipment.

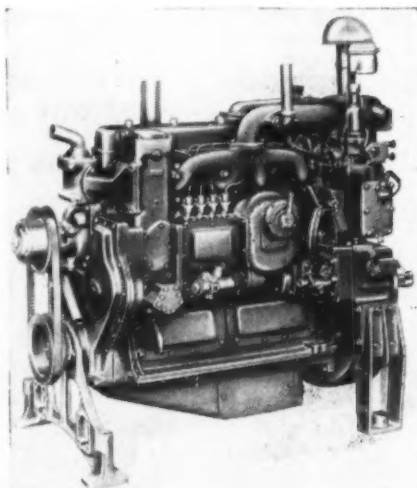
Block Machines for Manila

UNIVERSAL CONCRETE PIPE Co. recently shipped several special type block machines to Manila, P. I., consigned to one A. Sevilla. When in the United States recently Mr. Sevilla made the acquaintance of J. M. Millious, advertising and sales promotion manager for Universal; who was able to show Mr. Sevilla several recent photos of war damage to the islands. When the possibilities for concrete brick and block in the islands became evident, Mr. Sevilla returned to Manila and formed the Philippine Concrete Products Company with his father.

Change Diesel Engine

CATERPILLAR TRACTOR Co., Peoria, Ill., has started production of a new four-cylinder engine. The new D311 engine replaces the D3400 in the company's line and is available as an industrial power unit or an electric set. It develops a maximum output, with radiator fan and full equipment, of 49 hp. at 1700 r.p.m.

As outlined by the manufacturer, the new engine reflects extensive engineering and manufacturing research in design changes and in use of improved materials, and offers a marked power increase over the model which it replaces. Changes in the new engine include ¼-in. bore increase (to 4-in.), resulting in an increase to 252-cu. in. piston displacement; stronger connecting rods and a heavier crankshaft. Chrome plated top piston rings are said to increase piston life and divided manifolding allows an independent port for each valve, designed to im-



Design refinement in 4-cylinder Diesel

prove the flow of incoming air and exhaust gases. The new engine has a fuel injection valve designed with the pressure operated valve mechanism enclosed in a copper capsule, easily replaceable as a unit, with no over-flow lines required.

Mobile Dump Bucket

CONSTRUCTION PRODUCTS CORP., Lynwood, Calif., is manufacturing a new materials transport known as the



Materials transport with hydraulically controlled 20-cu. ft. hopper

Profit Mover, the first in a projected line of materials handling equipment to be known as the Profit System. According to the manufacturer the new machine is designed especially for moving concrete and other construction materials, and is a heavy-duty machine with ample power and tire size to carry 3000-lb. loads under the most adverse operating conditions.

The new machine is mounted on a J. I. Case VAI industrial tractor, with a 24-hp. Continental motor, Vickers hydraulic system and a 20-cu. ft. hopper. The manufacturer further states that the new unit has a high clearance and dumping height yet will operate under a two-sack mixer; it has a short turning radius and is equipped with finger touch controls. It also features a low speed for slowly moving up to forms for accurate spot placement of concrete or other materials, and has a high speed of 18 m.p.h.

Slag Production Up

PRODUCTION of iron blast-furnace slag in 1946 reached a new high of 16,706,792 short tons valued at \$14,869,839, a figure 32 per cent above the 1945 level of 12,635,868 tons valued at \$10,450,852, as reported by the Bureau of Mines.

Screened air-cooled slag, the major product, increased 25 per cent over the 1945 figure with the next largest increases percentagewise showing in sales to the construction industry. Lightweight aggregate required 773,150 tons, an increase of 230 per cent, while concrete block utilized 373,257 tons of the slag, 182 per cent more than in 1945.

Ready Mix

(Continued from page 121)

reclaimed by Scoopomobiles. Incidentally, the company has two of these handy pieces of equipment, and has been making a practice of renting them out on an hourly basis. For the Scoopomobiles a charge of \$6.50 per hour is made. A 4-cu. yd. dump truck is also sometimes put out on a rental basis at \$5.00 per hour with driver.

The company has seven mixer trucks available. One is a 3-cu. yd. Ransome and the others are Rex units. Of the latter, four are 2-cu. yd. capacity and two are 3-cu. yd. Deliveries average about 20 miles although longer hauls have been made. The plant's biggest daily production to date was 232 cu. yd., but 450 cu. yd. could be turned out if all trucks are available.

On the subject of labor and labor turn-over this company has no serious problems. Possibly one reason is that all but one of the employees are ex-service men. The owners of the company are R. H. Sutherland and C. K. Irwin. D. W. McPherson is manager, and Mrs. R. A. Fackler is secretary.

Portland Cement Shipments Increase

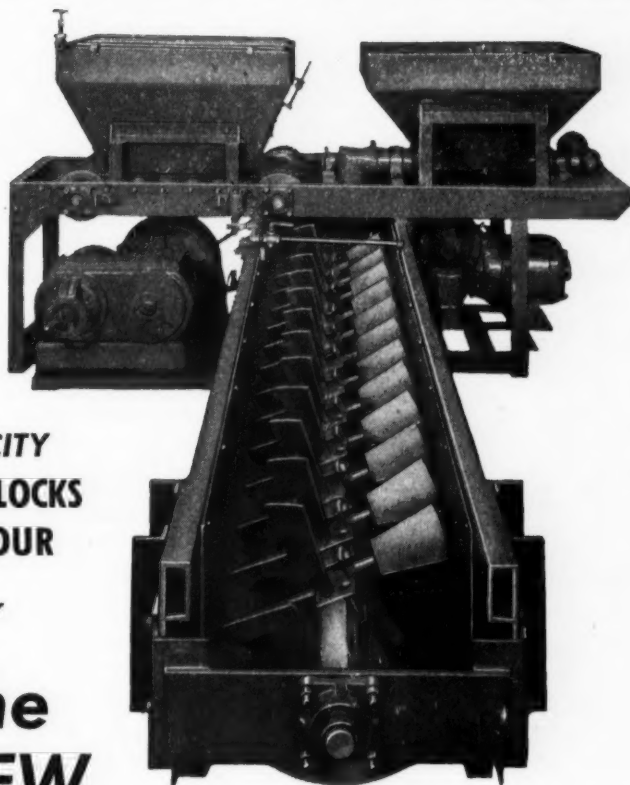
SHIPMENTS of 18,179,000 bbl. of portland cement inter- and intra-state, as reported to United States Bureau of Mines for June, 1947, showed an increase of 25 per cent over the same month in 1946. An increase in shipments was noted in all but six states for the month. Shipments during the first six months of 1947 were 5 per cent above those reported for the same period in the year preceding, with increases reported by 33 states.

In per cent change in shipments of portland cement within and to states in June, 1947, compared with June, 1946, the New England states had the greatest increase in three out of the nation's first five states. New Hampshire had the greatest increase, 86 per cent; Maine was second with 79 per cent; West Virginia increased shipments by 61 per cent; New York was a close fourth with 60 per cent and Massachusetts held fifth place with a figure of 58 per cent. Washington, D. C., tied with Kansas with an increase of 57 per cent. Arizona had the greatest increase in the far west with a figure of 40 per cent; Washington, Oregon and California reported 14, 42 and 11 per cent, respectively.

Nevada showed the greatest decrease at minus 43 per cent; with North Dakota and Nebraska nearly tied at minus 18 and minus 17 per cent, respectively.

Fuel consumption by cement companies increased in June, 1947, over June, 1946, in two out of three types: coal and fuel oil. A slight reduction in consumption for the same period was noted in natural gas and producer gas, combined for this study. The foregoing has been abstracted from Bureau of Mines monthly Cement Report No. CP 313.

Capable Companion Unit FOR THE MIGHTIEST BLOCK MACHINES



CAPACITY
1100 BLOCKS
PER HOUR

The NEW KENT Stediflo MIXER

Out of decades of experience in building continuous mixers KENT has now produced an advanced unit that delivers sufficient concrete to serve the largest block machines in existence.

Although rated at 1100 blocks per hour, it has actually produced concrete for 10,000 grade A blocks in a single day.

In addition to delivering uniform concrete in a continuous stream with practically no manpower attention and consequently at a new low cost — Stediflo is *low* in first cost — *low* in installation cost — *low* in operating cost — and *low* in maintenance cost.

If you operate a large block machine you need a Stediflo to release its full capacity. If you own smaller machines there is a Kent Continuous Mixer exactly suited to its needs. Write for information.

C. P.

The KENT MACHINE COMPANY

Manufacturers of CONCRETE PRODUCTS MACHINERY Since 1925

CUYAHOGA FALLS, OHIO, U.S.A.



"ANCHOR"

Complete EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Stearns Clipper Stripper Machines;
Stearns Joltcrete Machines; Stearns
Mixers; Cast Iron and Press Steel
pallets. Straublox Oscillating At-
tachments, etc.

Repair parts for: Anchor, Stearns,
Blystone Mixers and many others.

Anchor Concrete Mch. Co.

1191 Fairview Ave., Columbus 8, Ohio

Record Block Production

A RECORD OUTPUT of over 940 million units of concrete block (8- x 8- x 16-in. equivalent) was reached in the United States during 1946, nearly doubling the 400 million block recorded for 1945, according to figures released by the Bureau of the Census. In addition, a total of 218 million concrete brick was produced during the same period, three and a half times that of 1945. Of the total block output, 59 per cent was reported as made from heavy-weight aggregate and 41 per cent made from lightweight aggregates such as cinders, pumice, perlite, and expanded shale and clay.

Output of concrete masonry and the number of producing plants reached a peak during the third quarter of the year when 284 million block and 69 million brick were produced. A total of 3,474 producing plants was reported, of which 3,387 made block and 378 made brick. Pennsylvania ranked first as a producer of concrete block, followed by Michigan, Ohio, and New York. North Carolina ranked first in output of concrete brick followed by Georgia, Ohio, and Florida.

Block production per plant averaged 84,000 standard units during the third quarter of 1946 with a relatively larger proportion of the block produced by the larger plants being lightweight block. The smaller plants, producing less than 500,000 block during the quarter, accounted for 67 per cent of

heavyweight aggregate block. Over one-half of the total concrete brick output of 378 plants in the third quarter was produced by 87 plants that did not produce block.

New Lightweight Aggregate

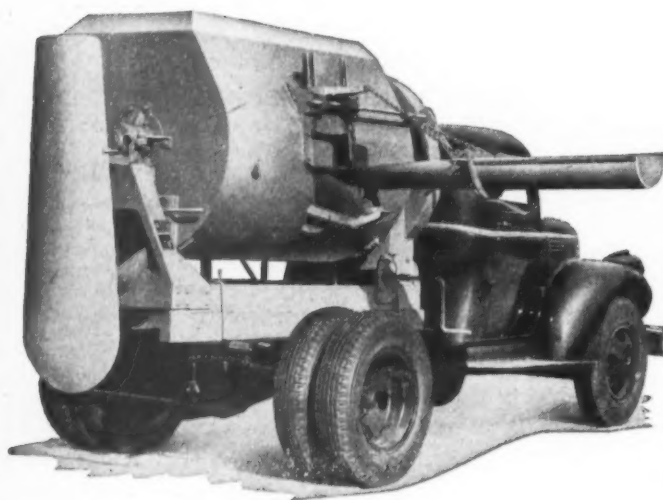
STEARNS MANUFACTURING Co., INC., Adrian, Mich., has announced that it is producing equipment for the manufacture of Sinterlite lightweight aggregate under patents and patent applications owned by the Sinter Processing Corporation, New York, N. Y.

The basic unit is the Sinterlite machine, consisting of an automatic continuously rotating sintering pan. The raw materials, mixed with a small amount of fuel are fed to this pan and sintered. This machine, together with the necessary equipment for handling, storage, and mixing of the raw materials, and for the handling, crushing, and grading of the finished clinker has been engineered by Stearns as a standard "package," with such alterations and expansion as are required for each individual installation.

With this equipment, concrete products manufacturers and others can produce from locally available materials a good aggregate. A wide variety of raw materials, including slag, clay, earths, and shale may be used in producing Sinterlite aggregate.

Louis Gelbman, concrete products manufacturer of New York, who was the patentee and owner of the Sinterlite process, has transferred his holdings to the Sinter Processing Corporation of New York of which Mr. Gelbman is president.

The New HIGH DISCHARGE Transport TRUCK MIXER



- ★ FAST OPEN TOP CHARGING
- ★ FULL VIEW INSPECTION
- ★ SUPERIOR MIXING PRINCIPLE
- ★ INSURES QUALITY CONCRETE
- ★ ALL STEEL CONSTRUCTION
- ★ LOW MAINTENANCE
- ★ ALL BEARINGS FULLY PROTECTED
- ★ GOOD DELIVERY

PHONE, WRITE, OR WIRE FOR DETAILS . . . FLANDERS 7800

CONCRETE TRANSPORT MIXER COMPANY, INC.
4985 FYLER AVE. ST. LOUIS 9, MISSOURI

Concrete-Eating Bacteria

BACTERIA that corrode solid concrete with sulfur-containing acids produced by their secretions have been discovered by Dr. C. D. Parker of the research laboratories of the Melbourne and Metropolitan Board of Works in Australia. The new species, which he has named "Thiobacillus concretivorus" or "sulfur-bacillus that eats concrete," are said to cause a great deal of trouble in concrete sewer pipes.

Block Exhibited at Fair

CLINTON CONSTRUCTION Co., concrete block and ready mixed concrete division, Wilmington, Ohio, stirred wide interest in the farm community with its exhibition of concrete block and floor slabs at the Clinton County Fair held at Wilmington recently. An open-air booth under a striped awning contained walls of typical block construction and several samples of reinforced concrete floor slabs manufactured by the company.

Veteran Builds Plant

K. T. BROADLEY, a veteran of both wars, recently opened a block plant in Gage, Okla., with a capacity of 1500 block per day. Gage Cement Products Co. manufactures only the heavy-weight aggregate block at this time.

Concrete Pipe Production At Site of Installation

AMERICAN PIPE and Construction Co., Los Angeles, Calif., is operating a complete concrete pipe manufacturing plant near Olympia, Wash. This plant was specially set up to produce the 35,000 ft. of 3-ft. pipe needed for the gravity-flow portion of the City of Olympia's water supply system.

Machinery for the plant was shipped from the company's Los Angeles and Oakland, Calif., headquarters. Designed to produce 12-ft. lengths of 3-ft. spun, reinforced pipe, the plant is housed in four structural steel sheds. The pipe spinning machines turn at a rate of 400 r.p.m. and the pipe is steam cured for eight hours. Reinforcing cages are made on an automatic spot welding machine that forms and welds the reinforcing bars in one operation.

Ready mixed concrete is trucked to the plant by a Tacoma firm, which allows the plant to be highly mobile. Fred Rischling, plant manager, pointed out that by moving the plant to the site of pipe installation, high pipe transportation costs were greatly lessened. He continued to say that the plant may continue to produce in the same location after the present job is completed, or that it could be dismantled, moved, and erected somewhere else in about 30 days.

American Pipe also has the contract for installing the concrete pipe as well as the steel pipe section.

Stockpiling Pumice

LAVALITE PRODUCTS Co., Tacoma, Wash., has received permission to start pumice yarding and stockpiling operations on a 30 acre tract near Olequa, which the company is in the process of purchasing as a permanent industrial site. Present plans call for the stockpiling of material there for use at the company's Tacoma plant, but later a manufacturing plant may be located on the land.

Officials Buy Land

F. L. CHRISTY, president, Marietta Concrete Corp., Marietta, Ohio, and C. B. Ross, the company's Baltimore plant manager, jointly bought a parcel of land near Marietta. The tract is comprised of a 51-acre farm, complete with buildings and standing crops; plus 80 building lots already subdivided, with improvements in. No immediate plans for disposition of the land were indicated by the new owners.

To Make "Stone" Veneer

PERMA-STONE CO. OF SOUTHWEST MISSOURI has been formed at Carthage, Mo., by Herbert Croley and Lloyd Grigsby, and will serve 12 counties. Perma-Stone is a synthetic stone veneer made of aggregates, Portland cement, crushed quartz, pure mineral colors, metallic hardener and water-proofer combined and molded directly on a prepared wall.

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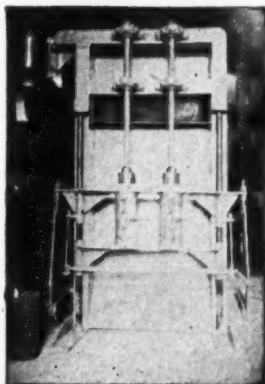
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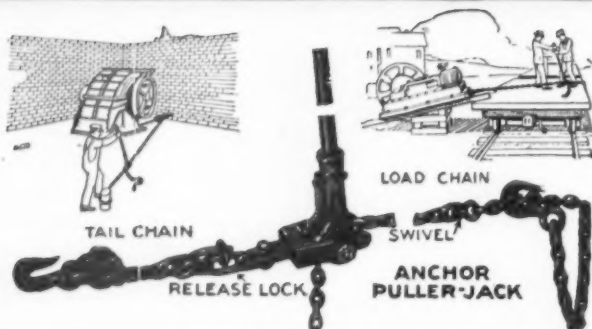
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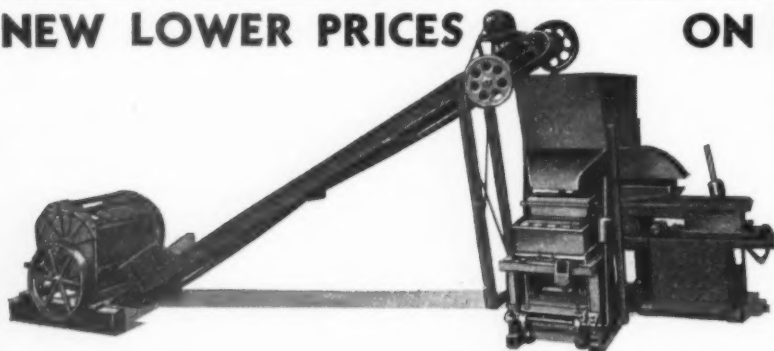
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